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To study the physico-chemical properties of soils of soybean growing areas from Renapur Tahsil of Latur district, Maharashtra

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Abstract
The present investigation entitled "Soil Fertility Evaluation of Soybean Growing Areas from Renapur Tahsil of Latur District" was undertaken for assessing the fertility status of soils from studied area. For this purpose, total 100 soil samples collected from 20 villages and 5 soil samples from each village were distributed according to their respective depth. Out of which 56, 26 and 18 number of samples were identified and categorized as Inceptisol, Entisol and Vertisol soil orders, respectively. These soil samples were analyzed for physico-chemical properties that is pH, electrical conductivity, organic carbon and calcium carbonate. The soils of Renapur tahsil were neutral to moderately alkaline in reaction, EC of the soil was no deleterious effect on crop. Low to moderate in organic carbon content and non-calcareous to calcareous in nature.

Keywords: PH, EC, OC, $CaCO_3$

Introduction
Latur is one of the districts in Marathwada region. It comes under Aurangabad administrative division. Latur district comprises total 10 tahsil, out of that Renapur tahsil selected for the study of soil fertility status. Major crops grown in this region were sugarcane, pigeon pea, gram, sorghum, wheat, soybean, groundnut, sunflower and some horticulture crops.
The physico-chemical properties like pH, EC, calcium carbonate and organic carbon are essential because they influence on availability of nutrients in soil and as a result crop growth and output. The organic carbon is the store house of all the plant nutrients. It provides good aeration, increase microbial activity, water holding capacity maintain the soil pH and calcium carbonate content in the soils. Supply of essential nutrient from the soil can be augmented by proper management of these property. For sustainable agriculture production the information on soil characterization in relation to fertility status of the soil of the region will be useful.

Materials and Methods
To evaluate soil fertility status of Renapur tahsil, 100 soil samples were collected from soybean growing area of tahsil. The twenty representative villages (Arajkheda, Sangavi, Gavhan, Andalgaon, bavchi, Itti, Nagapur, Kalewadi, Khanapur Pohergaon, Fardpur, Wala, Kamkheda, Sarola, Narwatwadi, kumbharwadi, Renapur, Shelu-kh, Kharola and harwadi) are selected and from each village 5 samples were collected. one hundred representative surface soil samples (15-20 cm) depth were collected. The soils were grouped into different orders according to USDA classification. Out of 100 samples, 56 soil samples were in Inceptisol, 26 soil samples were in Entisol and 18 soil samples were in Vertisol order, respectively.
The samples were analyzed for the physico-chemical properties of these soils, pH and Electrical conductivity (EC) in 1:2.5 soil water suspension (Jackson, 1978) [5]. The organic carbon estimated by modified method of Walkley and Black method (Jackson, 1978) [5]. Calcium carbonate determined by rapid titration method (Piper, 1966) [11].

Results and Discussion
Out of all one hundred soil samples, 56 soil samples under Inceptisol, while 26 and 18 soil samples categorized in Entisol and Vertisol, respectively. The data on physico-chemical properties of Inceptisol, Entisol and Vertisol soils are presented in table 1, 2 and 3, respectively.

Physico-chemical properties of Inceptisol soils in Renapur tahsil.

The physico-chemical properties of Inceptisol soil are presented in table 1. The lowest pH value (6.54) was recorded in soil sample (V_7S_5) from Andalgaon village, while the highest pH (8.14) of the soil sample ($V_{18}S_2$) was observed in Wala village. In Inceptisol soil the pH ranged from 6.54 to 8.14 with an average value 7.54. The data presented in table 4 and depicted in fig 2 reported that, out of 56 soil sample from Inceptisol, 14 samples (25%) were neutral in reaction (pH 6.5-7.5) and 42 samples (75%) were moderately alkaline in reaction (7.5-8.5).

The highest EC (1.59 dSm^{-1}) was recorded in soil sample (V_5S_1) from Arajkheda village and the lowest EC (0.27 dSm^{-1}) was observed in the soil sample ($V_{14}S_1$) in Gavhan. The EC was ranged from 0.27-1.59 dSm^{-1} with a mean value of 0.65 dSm^{-1}. The data presented in table 4 and depicted in fig 3 revealed that out of 56 soil samples, 53 soil samples (94%) was no deleterious effect on crop and 3 samples (6%) were critical for germination.

Organic carbon content (Table 1) was ranged from 1.5 to 8.7 g kg^{-1} with an average value 4.52 g kg^{-1}. The soil sample ($V_{16}S_5$) from Narvatwadi village showed lowest content of organic carbon (1.5 g kg^{-1}) while the highest organic carbon content (8.7 g kg^{-1}) was recorded in sample (V_5S_1) from Arajkheda village. The data presented in table 5 and depicted in fig 4 revealed that out of 56 soil samples from Inceptisol, 1 sample (2%) was very low, 23 samples (41%) were low, 23 samples (41%) were moderate, 7 samples (12%) moderately high and 2 samples (4%) were high in organic carbon content.

The highest value of calcium carbonate (82 g kg^{-1}) was recorded in Faradpur village ($V_{19}S_5$) and lowest calcium carbonate content (20 g kg^{-1}) was observed from Khanapur village ($V_{10}S_4$). The calcium carbonate content in this soil were varied from 20 to 82 g kg^{-1} with an average value of 55.13 g kg^{-1}. The data presented in table 5 and depicted in fig 4 shows that, out of 56 soil samples, 23 samples (41%) were non-calcareous (Fit for all crops) in nature and 33 samples (59%) were calcareous (Fit for all crops except citrus) in nature.

Table 1: Physico-chemical properties of Inceptisol soils in Renapur tahsil

Sr. No.	Sample No.	pH	EC (dSm^{-1})	OC (g kg^{-1})	$CaCO_3$ (g kg^{-1})
1	V_3S_1	7.04	0.48	8.2	78
2	V_3S_2	7.47	0.39	3.0	74
3	V_3S_3	7.46	0.63	3.8	62
4	V_3S_4	7.80	1.36	4.9	69
5	V_3S_5	7.55	0.69	4.1	47
6	V_4S_1	7.71	1.20	6.1	39
7	V_4S_2	7.78	0.69	4.9	47
8	V_4S_3	7.76	0.88	4.6	46
9	V_4S_4	7.56	0.52	3.9	75
10	V_4S_5	7.83	0.50	3.7	50
11	V_5S_1	7.96	1.59	8.7	46
12	V_5S_2	7.81	0.68	4.9	75
13	V_5S_4	7.58	0.36	4.0	31
14	V_6S_1	7.38	0.56	4.0	29
15	V_6S_2	7.50	0.59	4.5	69
16	V_6S_5	7.29	0.72	3.6	59
17	V_7S_1	7.62	0.71	5.2	64
18	V_7S_2	7.63	0.89	3.6	64
19	V_7S_4	7.56	0.73	3.4	74
20	V_7S_5	6.54	0.89	2.9	43
21	V_8S_1	7.48	0.46	3.4	67
22	V_8S_2	7.47	0.55	4.0	53
23	V_8S_3	7.49	0.59	6.7	32
24	V_8S_4	6.70	0.61	3.3	73
25	V_8S_5	6.77	0.75	2.9	39
26	V_9S_1	7.45	0.79	3.0	48
27	V_9S_5	7.01	0.56	3.1	40
28	$V_{10}S_2$	7.78	0.64	5.8	35
29	$V_{10}S_4$	7.86	0.54	4.6	20
30	$V_{11}S_2$	7.52	0.87	5.3	43
31	$V_{12}S_3$	7.72	0.86	7.6	57
32	$V_{13}S_2$	7.60	0.63	3.7	32
33	$V_{13}S_3$	7.58	0.73	6.9	58
34	$V_{13}S_4$	7.51	0.68	4.6	70
35	$V_{14}S_1$	7.12	0.27	4.8	35
36	$V_{14}S_2$	6.95	0.54	4.6	41
37	$V_{14}S_3$	7.58	0.33	4.1	78
38	$V_{15}S_1$	7.52	0.76	6.5	55
39	$V_{15}S_2$	7.48	0.63	3.1	70
40	$V_{15}S_3$	7.62	0.35	5.1	57
41	$V_{15}S_4$	7.64	0.58	4.4	60
42	$V_{15}S_5$	7.51	0.39	5.1	66
43	$V_{16}S_2$	7.57	0.77	5.4	72

44	$V_{16}S_4$	7.58	0.66	3.7	70
45	$V_{16}S_5$	7.61	0.72	1.5	35
46	$V_{17}S_3$	7.63	0.83	3.3	65
47	$V_{17}S_5$	7.55	0.49	4.2	75
48	$V_{18}S_2$	8.14	0.31	2.3	40
49	$V_{18}S_3$	7.72	0.41	5.2	35
50	$V_{19}S_1$	7.60	0.83	4.8	63
51	$V_{19}S_2$	7.82	0.79	5.1	59
52	$V_{19}S_4$	7.60	0.45	4.0	57
53	$V_{19}S_5$	7.94	0.47	4.5	82
54	$V_{20}S_1$	7.62	0.69	3.8	49
55	$V_{20}S_4$	8.02	0.34	4.5	57
56	$V_{20}S_5$	8.09	0.83	6.2	67
Range		6.54-8.14	0.27-1.59	1.5 - 8.7	20-82
Mean		7.54	0.65	4.52	55.13
S.E.		0.04	0.03	0.18	2.07
C.V. (%)		4.16	37.07	30.69	28.13

Physico-chemical properties of Entisols in Renapur tahsil

Physico-chemical properties of Entisol soils are presented in table 2. From this data, it was revealed that the lowest soil pH value (6.65) was recorded in Khanapur village soil sample ($V_{10}S_3$) and the highest pH (8.11) was recorded from Wala village sample ($V_{18}S_5$). In this soil, pH was ranged from 4.36 to 8.11 with a mean value 7.51. The data presented in table 4 and depicted in fig 1 revealed that, out of 26 soil samples from Entisols, 4 samples (16%) were neutral and 22 samples (84%) were moderately alkaline in reaction.

The lowest EC (0.35 dSm^{-1}) was recorded in soil sample ($V_{18}S_5$) from Wala village, while the highest EC (1.25 dSm^{-1}) was observed from Sangvi village (V_6S_4). The range of EC was ranged from 0.35 to 1.25 dSm^{-1} with an average value of 0.69 dSm^{-1}. The data presented in table 4 and depicted in fig 2 revealed that, out of 26 soil samples from Entisol, 23 samples (88%) were no deleterious effect on crop and 3 samples (12%) were critical for germination.

Organic carbon content was lowest (0.40 g kg^{-1}) in Arajkheda village (V_5S_3) and the highest organic carbon content (7.80 g kg^{-1}) observed from Khanapur village ($V_{10}S_1$). The organic carbon content was ranged from 0.40 to 7.80 g kg^{-1} with a mean value of 4.81 g kg^{-1}. The data presented in table 5 and depicted in fig 3 shows that out of 26 soil samples, 1 sample (4%) were very low, 8 samples (31%) were low, 11 samples (42%) were moderate and remaining 6 samples (23%) were moderately high content of organic carbon.

Lowest value of calcium carbonate (27 g kg^{-1}) was observed from Faradpur village ($V_{19}S_3$) and the highest value of calcium carbonate (119 g kg^{-1}) was recorded in soil sample ($V_{18}S_5$) from Wala village. The calcium carbonate content of Entisol soils ranged from 27 to 125 g kg^{-1} with an average value of 81.39 g kg^{-1}. The data presented in table 5 and depicted in fig 4 revealed that, out of 26 soil samples from Entisol, 2 samples (8%) were Non calcareous (Fit for all crops), 20 samples (77%) were calcareous (Fit for all crops except citrus) and 4 samples (15%) were highly calcareous (Unfit for all crops) in nature.

Table 2: Physico-chemical properties of Entisol soils in Renapur tahsil

Sr. No.	Sample No.	pH	EC (dSm^{-1})	OC (g kg^{-1})	$CaCO_3$ (g kg^{-1})
1	V_5S_3	7.68	0.56	0.4	69
2	V_5S_5	8.00	1.09	6.1	117
3	V_6S_3	7.56	1.00	7.6	77
4	V_6S_4	7.26	1.25	4.2	69
5	V_7S_3	7.77	0.81	4.9	78
6	V_9S_3	7.59	0.39	3.7	64
7	$V_{10}S_1$	7.66	0.89	7.8	89
8	$V_{10}S_3$	6.65	0.69	2.4	93
9	$V_{10}S_5$	7.68	0.79	4.2	117
10	$V_{11}S_1$	7.46	0.96	7.8	45
11	$V_{11}S_3$	7.80	0.64	4.9	65
12	$V_{11}S_4$	7.64	0.41	7.2	84
13	$V_{12}S_2$	7.68	0.47	2.8	77
14	$V_{12}S_4$	7.75	0.49	4.7	89
15	$V_{12}S_5$	7.75	0.59	3.8	58
16	$V_{13}S_1$	6.70	0.43	2.9	92
17	$V_{13}S_5$	7.03	0.36	3.9	54
18	$V_{14}S_5$	7.72	0.87	3.2	99
19	$V_{16}S_1$	7.65	0.81	3.4	112
20	$V_{16}S_3$	7.52	0.64	5.8	83
21	$V_{17}S_1$	7.59	0.68	4.5	70
22	$V_{17}S_2$	7.78	0.66	6.0	98
23	$V_{18}S_1$	7.78	0.86	5.9	89
24	$V_{18}S_5$	8.11	0.35	6.9	119
25	$V_{19}S_3$	7.95	0.49	5.9	27
26	$V_{20}S_3$	7.98	0.79	4.2	87

Range	6.65-8.11	0.35-1.25	0.4-7.8	27-119
Mean	7.51	0.69	4.81	81.39
S.E.	0.13	0.04	0.36	4.48
C.V. (%)	9.40	34.41	38.10	28.07

Physico-chemical properties of Vertisol soils in Renapur tahsil

The data of physico-chemical characteristics of Vertisols are presented in table 3. The lowest pH (7.00) was recorded in Harwadi soil sample (V_1S_3) while the highest pH (8.2) observed from Itti village ($V_{12}S_1$). The pH of the soils were ranged from 7.0 to 8.2 with an average value of 7.60. The data presented in table 4 and depicted in fig 1 noticed that out of 18 soil samples from Vertisols, 6 samples (34%) were neutral and 12 samples (66%) were moderately alkaline in reaction.

The highest EC (0.88 dSm^{-1}) was observed in soil samples of Nagapur ($V_{11}S_5$) and Harwadi (V_1S_3), while the lowest EC (0.28 dSm^{-1}) recorded in Harwadi village soil sample (V_1S_4). The EC value of soil sample were varied from 0.28 to 0.88 dSm^{-1} with a mean value 0.51 dSm^{-1}. The data presented in table 4 and depicted in fig 2 revealed that out of 18 soil samples from Vertisols, all 18 samples (100%) has no deleterious effect on crop.

The highest organic carbon content (7.9 g kg^{-1}) was observed in Sarola village ($V_{20}S_2$) and lowest organic carbon (2.2 g kg^{-1}) was observed in Shelu (V_2S_5) and Harwadi (V_1S_3) village. The range of organic carbon in these soil sample were 2.2 to 7.9 g kg^{-1} with a mean value 4.08 g kg^{-1}. The data presented in table 5 depicted in fig 3 revealed that, out of 18 samples, 10 samples (55%) were low, 7 samples (39%) moderate and remaining 1 sample (6%) was moderately high content of organic carbon.

The lowest value of calcium carbonate content (35 g kg^{-1}) was recorded from Harwadi village sample (V_1S_3) and the highest value calcium carbonate (110 g kg^{-1}) observed in Itti village sample ($V_{12}S_1$). Calcium carbonate content were varied from 35 to 110 g kg^{-1} with an average 63.65 g kg^{-1}. The data presented in table 5 and depicted in fig 4 noticed that out of 18 soil samples, 5 sample (28%) were non-calcareous (Fit for all crops), 12 samples (67%) were calcareous (Fit for all crops except citrus) and remaining 1 sample (5%) highly calcareous (Unfit for all crops) in nature.

The pH of Inceptisol, Entisol and Vertisol soils (Table 1, 2, 3) ranged from 6.54 to 8.14, 6.65 to 8.11 and 7 to 8.2 with a mean value 7.54, 7.51 and 7.60, respectively. The data presented in table 4 and depicted in fig 1 revealed that the 25, 16 and 34 per cent soil samples in Inceptisol, Entisol and Vertisol were neutral in reaction, respectively and 75, 84 and 66 per cent soil samples in Inceptisol, Entisol and Vertisol were moderately alkaline in reaction. These values of pH indicates that most of the soils under study were neutral to moderately alkaline in reaction. The alkaline reaction of soil is probably due to the presence of sufficient free lime content and basaltic alluvium parent material rich in aluminosilicate and alkaline earth from which these are derived. (Challa., 1995) [3]. The neutral nature of soil due to presence of bases and calcium/magnesium carbonate in the soils Borkar *et al.* (2018) [2]. The alkaline nature of soil is due to presence of free lime in the soils. Slightly alkaline nature of pH due to calcareous nature of these soils Magare *et al*. (2019) [8]. These results are also in close agreement with those reported by Patil *et al.* (2019) [10] noted pH range 4.5 to 8.1 from the soils of Washi tahsil of Osmanabad district.

From the data of table no., 1, 2, 3 it was observed that the EC of the soils in Renapur tahsil ranged from 0.27 to 1.59 dSm^{-1}, 0.35 to 1.25 dSm^{-1} and 0.28 to 0.88 dSm^{-1} in Inceptisol, Entisol and Vertisol, respectively, with an average value of 0.65, 0.69 and 0.51 dSm^{-1}, respectively. The data presented in table 4 and depicted in fig 2 noticed that, 94 per cent, 88 per cent and 100 per cent soil samples of Inceptisol, Entisol and Vertisol were no deleterious effect on crop and 6 per cent, 12 per cent soil samples of Inceptisol, Entisol were critical for germination. The low content of EC was due to leaching of salt from the surface layer of soil. The values of EC obtained in analysis were found in desirable range as proposed by Richard and Cambell (1948) [12], when EC exceed 4 dSm^{-1}, the salt present become harmful to the crop growth. Ajgaonkar and Patil (2017) [1] reported that the EC were ranged from 0.20 to 1.70 dSm^{-1} from the soils of Aurangabad district. These values of EC are safe for crop growth.

The organic carbon content in Inceptisol, Entisol and Vertisol soils (Table 1, 2, 3) ranged from 1.5 to 1.59, 0.4 to 7.8 and 2.2 to 7.9 g kg^{-1} with average value 4.52, 4.81 and 4.08 g kg^{-1}, respectively. Soils of these tahsil were low to medium in organic carbon content. The data presented in table 5 and depicted in fig 3 reported that, 41 per cent, 31 per cent and 55 per cent samples of Inceptisol, Entisol and Vertisol soils were low organic carbon content, respectively, while 12 per cent, 23 per cent and 6 per cent soil samples of Inceptisol, Entisol and Vertisol were moderately high in organic carbon content. The variation in organic carbon content in the soil due to high temperature which is responsible for hasten the rate of oxidation and very little addition of organic matter and crop residues in the soil. low to medium status of organic carbon was found in surveyed areas soil samples. The content of organic carbon in soils depends on the range of precipitation within experiment area, pattern of rainfall in the area. Organic carbon is also attributed to the variation in decomposition rate. Kashiwar *et al*. (2019) [7] noticed that the organic carbon content ranged from 2.7 to 8.6 g kg^{-1} from the soils of Sakoli tahsil of Bhandara district. Naiknaware (2018) [9] reported that the organic carbon ranged from 4.8 to 8.6 g kg^{-1} from the soils of Osmanabad district of Maharashtra.

The calcium carbonate content in Inceptisol, Entisol and Vertisol soils (Table 1, 2, 3) varied from 20 to 82, 27 to 119 and 35 to 110 g kg^{-1} with a mean value 55.13, 81.39 and 63.65 g kg^{-1}, respectively. The data presented in table 5 and depicted in fig 4 revealed that, 41 per cent, 8 per cent and 28 per cent soil samples of Inceptisol, Entisol and Vertisol were non-calcareous (Fit for all crops) in nature along with 59 percent, 77 per cent and 67 per cent soil samples of Inceptisol, Entisol and Vertisol were calcareous (Fit for all crops except citrus) in nature and 15 per cent and 5 per cent soil samples of Entisol and Vertisol were highly calcareous (Unfit for all crops) in nature. Data on calcium carbonate content of soils revealed that the soils were non-calcareous to calcareous and highly calcareous in nature. This might be due to presence of calcium carbonate in powdery form and hyper thermic temperature. Relative more accumulation of calcium carbonate in Vertisol soils and associated black soils, may be partly associated with their origin with rich in alkali earth and due to calcification process in this region. Waghmare *et al*. (2008) [13] reported that the $CaCO_3$ content in Ausa tahsil of

Latur district ranged from 8.80 to 125 g kg^{-1}. Ganorkar and Chinchmalatpure (2013) [4] studied soils of Rajura Bazar of Amravati district and noticed that the calcium carbonate content were ranged from to 52.5 to 72.5 g kg^{-1}. Jibhakate *et al*. (2009) [6] reported that calcium carbonate content ranged from 38.4 to 96.9 g kg^{-1} from Ketol tahsil of Nagpur district.

Table 3: Physico-chemical properties of Vertisol soils in Renapur tahsil

Sr. No.	Sample No.	pH	EC (dSm^{-1})	OC (g kg^{-1})	$CaCO_3$ (g kg^{-1})
1	$V_1 S_1$	7.57	0.36	2.8	44
2	V_1S_2	7.22	0.52	3.7	70
3	V_1S_3	7.00	0.88	5.4	35
4	V_1S_4	7.31	0.28	2.2	70
5	V_1S_5	7.60	0.62	3.9	67
6	V_2S_1	7.74	0.68	5.6	45
7	V_2S_2	7.63	0.37	3.1	75
8	V_2S_3	7.60	0.36	2.3	47
9	V_2S_4	7.24	0.38	3.0	78
10	V_2S_5	7.50	0.33	2.2	80
11	V_9S_2	7.66	0.66	6.0	67
12	V_9S_4	7.47	0.55	2.9	59
13	$V_{11}S_5$	7.77	0.88	3.1	67
14	$V_{12}S_1$	8.20	0.38	4.6	110
15	$V_{14}S_4$	7.67	0.55	4.2	40
16	$V_{17}S_4$	7.85	0.60	4.9	50
17	$V_{18}S_4$	8.09	0.47	5.8	68
18	$V_{20}S_2$	7.69	0.38	7.9	56
Range		7-8.2	0.28-0.88	2.2-7.9	35-110
Mean		7.60	0.51	4.08	63.65
S.E.		0.06	0.04	0.37	4.24
C.V. (%)		3.87	35.02	38.79	28.32

Table 4: Order wise categorization of soils from Renapur tahsil on the basis of pH and EC

	Soil orders	Categories	Strongly acidic (< 5.5)	Moderately acidic (5.5-6.0)	Slightly acidic (6.0-6.5)	Neutral (6.5-7.5)	Mod. alkaline (7.5-8.5)	Strong. alkaline (> 8.5)
pH	Inceptisol	No. of sample	-	-		14	42	-
		Per cent	-	-		25	75	-
	Entisol	No. of sample	-	-		4	22	-
		Per cent	-	-		16	84	-
	Vertisol	No. of sample	-	-		6	12	-
		Per cent	-	-		34	66	-
EC (dSm^{-1})	Soil orders	Categories	No deleterious effect on crop (< 1.0)		Critical for germination (1.0-2.0)		Critical for salt sensitive crop (2.0-3.0)	Injuries to most crops (> 3.0)
	Inceptisol	No. of sample	53		3		-	-
		Per cent	94		6		-	-
	Entisol	No. of sample	23		3		-	-
		Per cent	88		12		-	-
	Vertisol	No. of sample	18		-		-	-
		Per cent	100		-		-	-

Table 5: Order wise categorization of soil of Renapur tahsil on the basis of Organic carbon and $CaCO_3$ content

	Soil orders	Categories	Very low (< 2)	Low (2.1-4.0)	Moderate (4.1-6.0)	Mod. High (6.1-8.0)	High (8.1-10)	Very high (> 10)
Organic carbon (g kg^{-1})	Inceptisol	No. of sample	1	23	23	7	2	-
		Per cent	2	41	41	12	4	-
	Entisol	No. of sample	1	8	11	6	-	-
		Per cent	4	31	42	23	-	-
	Vertisol	No. of sample	-	10	7	1	-	-
		Per cent	-	55	39	6	-	-
Calcium carbonate (g kg^{-1})	Soil orders	Categories	Non. Calcareous (< 50) (Fit for all crops)		Calcareous (50-100) (Fit for all crops except citrus)		Highly Calcareous (> 100) (Unfit for all crops)	
	Inceptisol	No. of sample	23		33		-	
		Per cent	41		59		-	
	Entisol	No. of sample	2		20		4	
		Per cent	8		77		15	
	Vertisol	No. of sample	5		12		1	
		Per cent	28		67		5	

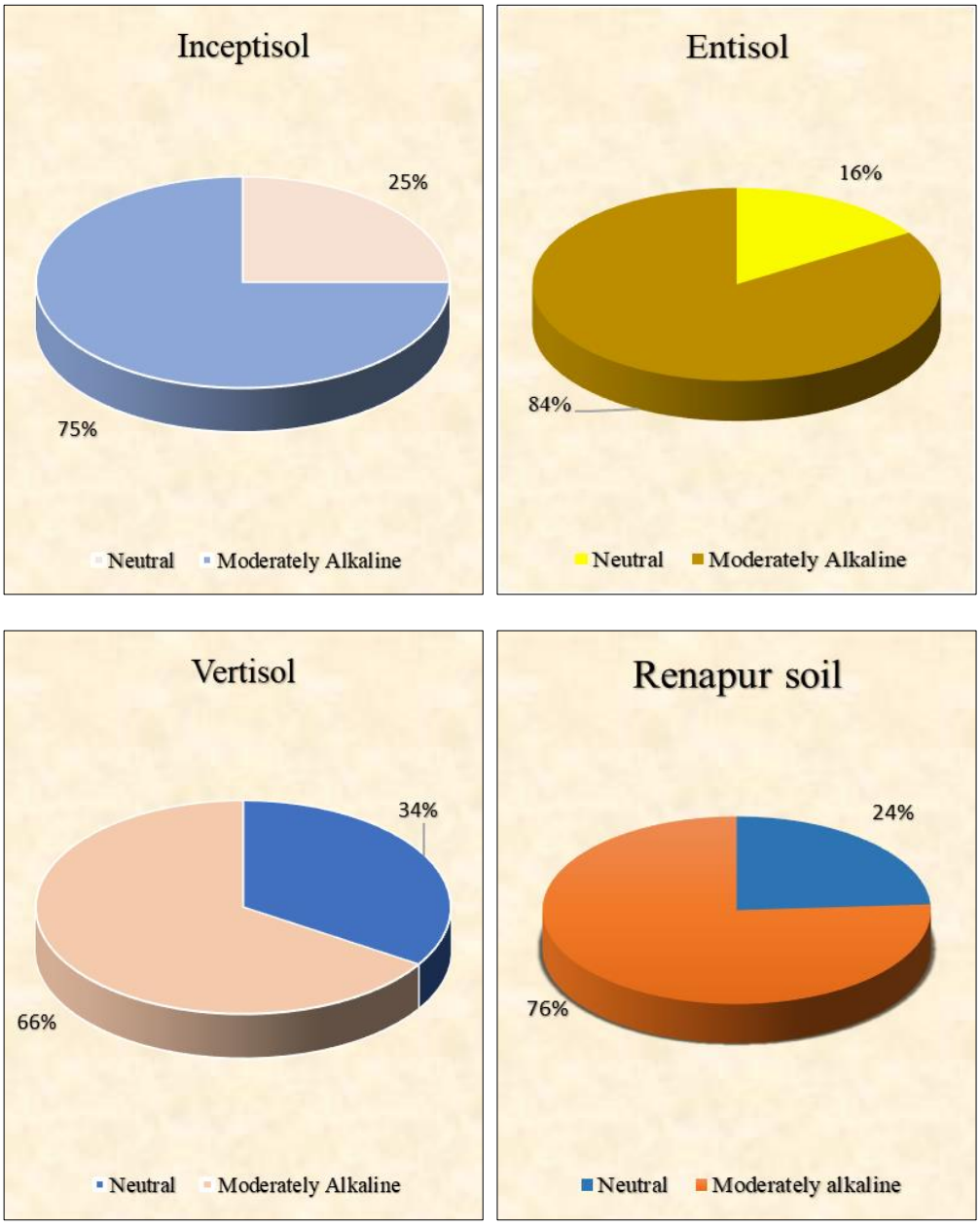
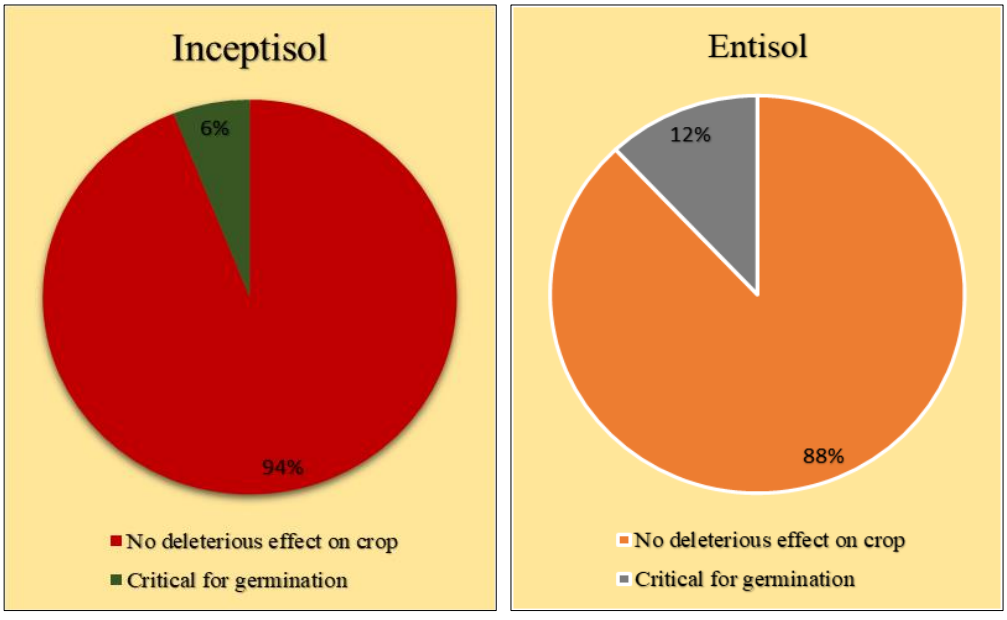


Fig 1: Categorisation of soil pH in Renapur tahsil.



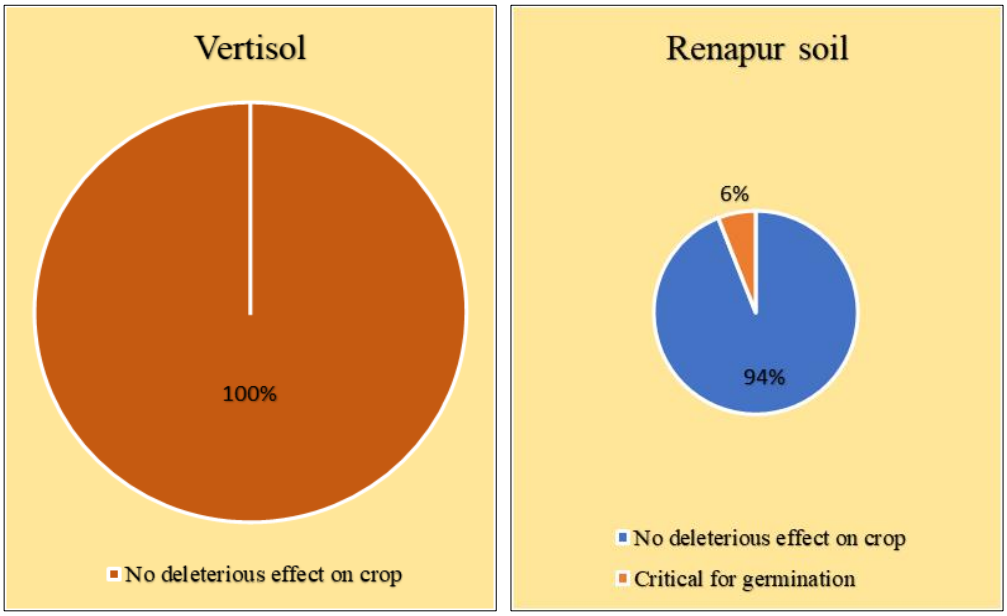


Fig 2: Categorization of EC in Renapur tahsil.

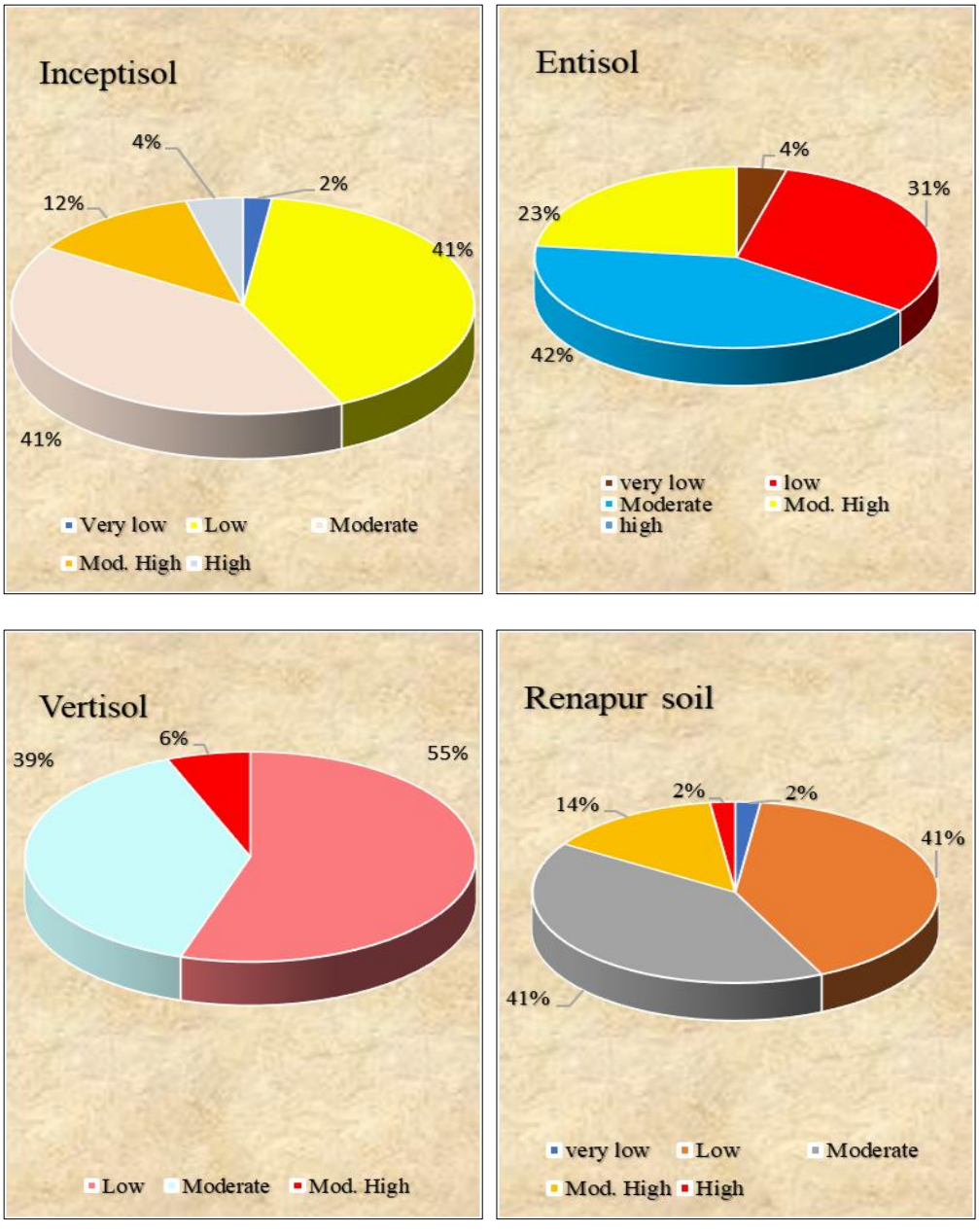


Fig 3: Categorization of organic carbon content in Renapur tahsil.

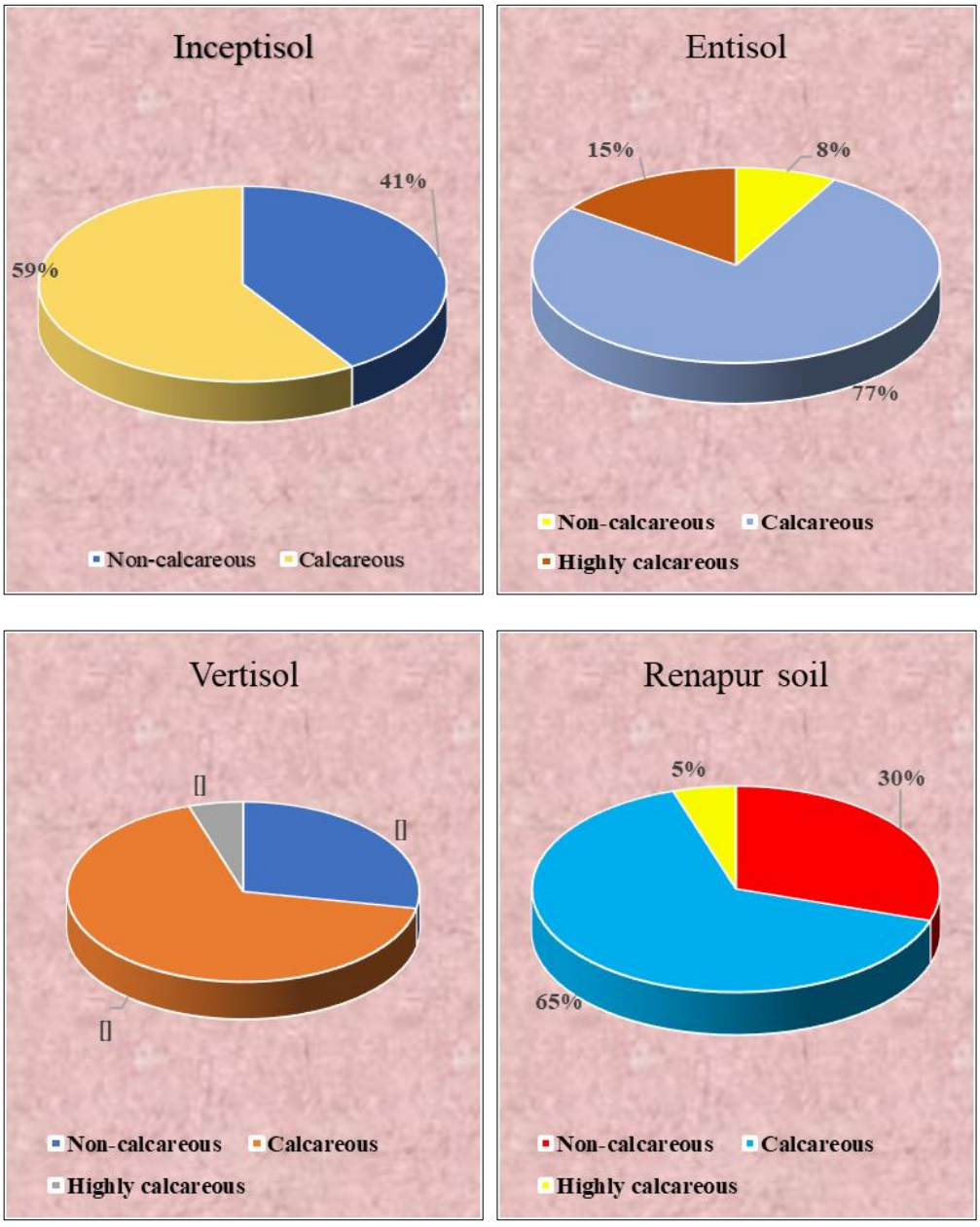


Fig 4: Categorisation of calcium carbonate content in soils of Renapur tahsil.

Conclusion

On the basis of soil characteristics, the soils from Renapur tahsil were grouped into Inceptisol, Entisol and Vertisol. In Renapur tahsil 56, 26 and 18 per cent soil samples were distributed into Inceptisol, Entisol and Vertisol, respectively. Most of the soils of Renapur tahsil was found neutral to moderately alkaline in reaction. EC of the soil was safe (no deleterious effect on crop). The organic carbon status of Renapur tahsil soil was low to moderate. Calcium carbonate content in these soils were non-calcareous (Fit for all crops) to calcareous (Fit for all crops except citrus) in nature.

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