



A Geographical Study of Soil Characteristic in Sugarcane Cultivation of Rahuri Tahsil of Ahmednagar District (MS)

Dilip Mahipati Nalage

Ph. D., Research Scholar, Savitribai Phule Pune University, Research Centre: Ramkrishna More College of Arts, Sci & Comm, Akurdi, Pune, Maharashtra, India.

Received 28th August 2017, Accepted 1st October 2017

Abstract

Sugarcane requires more water compare to other crops within growth periods. Its requires more water in summer season due to increases in temperature. Its growth is found successfully where the annual rainfall received 1400 to 2500 mm. pH in water is high (more than 8.1) is found in 21.72 percent villages. These villages come under canal and other source of irrigation. Less than 7.5 pH is found in 44 percent villages in the study area. EC in soil is suggested that it's sufficient range in 25.54 percent villages. Calcium is existing less than 1.5 per kg/hr. is not sufficient for sugarcane. It is found high proportion (more than 3.1 per kg/hr.) in 37 percent villages in study area. Magnesium covered high ratio in 28 villages and chlorides is found on high ratio in 67 percent villages, which is affected on sugarcane growth.

Keywords: Geographical, Soil, Sugarcane Cultivation.

© Copy Right, IJRRAS, 2017. All Rights Reserved.

Introduction

This chapter deals with the sugarcane cultivation of Rahuri tahsil with discussion of physical, chemical parameters. The main objectives of this chapter are to know the present sugarcane cultivation with its supporting and controlling factor in study area. Sugarcane is a main and important cash crop found in the Rahuri tahsil. Its geographical condition is suitable for sugarcane production. In this chapter, chemical parameters of Soils explained in detail. The area of sugarcane increased after construction of Mula Dam after 1970. Actually, the area of Rahuri tahsil comes under rain shadow zone so the water scarcity is the main problem which effects on the agriculture production and development. Considering this geographical condition of Rahuri tahsil is known for its agriculture development. Farmers are adopting new techniques for better

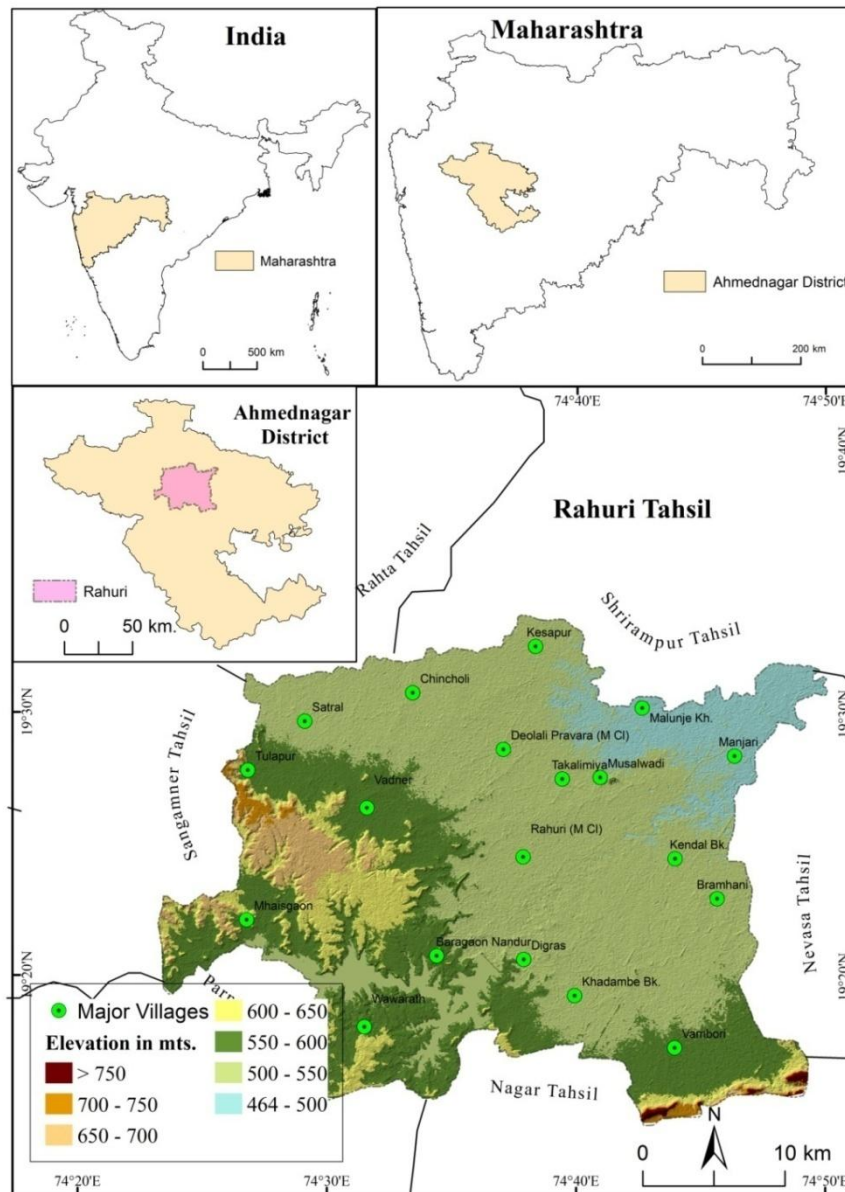
agriculture productions. Farmers view has become scientific in terms of agriculture. They agree with new technology for sufficient production (Shinde, Pathak, 2006). It was observed that 85 to 90 percent of sugarcane production is under flood methods of irrigation.

Farmers supply water by traditional methods because they believe that if more water will be given to crop it will helps to maximise production. More water supply affects on soil health, therefore it is necessary to study various soil parameters and their present situation in soil.

Correspondence

Dilip Mahipati Nalage
E-mail: dilipnalage@rediffmail.com

Map- 1: Location map



Study Area

Rahuri is located at 19° 15' to 19° 30' North Latitude and 74° 15' to 74° 30' East Longitude, in the north eastern part of Ahmednagar District, Maharashtra (India). Rahuri tahsil is bounded by Rahata tahsil on the north, Nagar tahsil on the south, Nevasa on east and Sangamner and Parner tehsil on the west, of the same district. It is well connected by roads to Mumbai (240 k.m.), Pune (140 k.m.), Aurangabad (120 k.m.) and the district headquarter Ahmednagar (37 k.m.). Rahuri tahsil included 98 villages.

Selected Villages

Selection criterion is very important to suggest any plan or conclusion of the study. Generally Sugarcane found on large scale where river basin or canal irrigation

facility is available. All physical and social factors are considered for selection of villages. Study area is divided into seven divisions such as Rahuri, Deolali, Satral, Taharabad, Vambori, Bramhani and Taklimiya. 98 villages included in Rahuri tahsil. Soil sample collected from Sai Datta Soil Testing Laboratory, Rahuri. 04 soil testing report from each village, thus there are more than 380 soil test report presented in following table.

pH in soil

Perhaps the most important property of soil as related to plant nutrition is its hydrogen ion activity, or pH. Soil pH affects the soil's physical, chemical, and biological properties and processes, as well as plant growth. The nutrition, growth, and yields of most crops decrease where pH is low and increase as pH rises to an optimum level. The pH value of soil is suitable any crop

between the 6.5 to 7.5. Because pH also supports the crop growth and supply nutrient from underground. Sugarcane is grows normally in this condition. But the

increase in pH is increased from 7.5 to more than 8.01 restrict the soil health condition which does not support to crop growth.

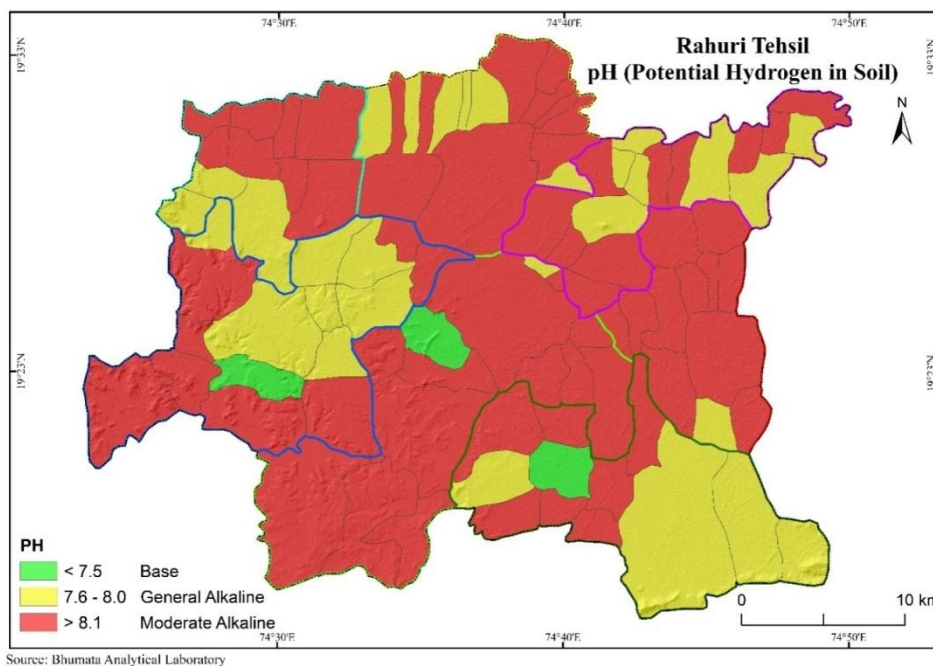
Table 1
pH Value of Soil in Various Villages

Sr. No.	Division	Number of Villages			pH% 6.5 to 7.5	% pH 7.6 to 8	% pH 8.1 to 8.5	%	Total Villages
		Lass 6.5 to 7.5	7.6 to 8	More 8.1					
1.	Rahuri	01	00	13	7.69	00	92.85	100	14
2.	Deolali	0	05	11	00	31.25	68.75	100	16
3.	Satral	0	03	08	00	27.28	72.72	100	11
4.	Taharabad	01	06	09	5.25	37.05	56.25	100	16
5.	Vambori	01	04	07	8.34	33.33	58.33	100	12
6.	Bramhani	00	00	12	00	00	100	100	12
7.	Taklimiya	00	08	09	00	47.05	52.95	100	17
Grand Total		03	26	69	21.28	175.96	501.85	100	98
Average pH of study area: %					3.04	25.10	71.76	100.00	

The pH of soil is recorded only 25.10 % area in study region. The extra pH exist which indicates that soil health is not proper. pH more than 8.1 to 8.5 is found on 71.76 % area in Rahuri tahsil. The high soil pH (more than 8.1) is found almost all divisions in Rahuri tahsil. Its cover 92.85 percent and 72 percent area respectevly Rahuri and Satral division. This divisions provide irrigation facility to farmers by Pravara and Mula canal

and at the same time from river Pravara and Mula supplied water under well, tube well and lift irrigation system. Beside this division the remaining part of the study region is found less area under under high pH. Which is averegelly 50 to 70 percent only. 69 villages facing the problems of high Ph, So their yield of sugarcane is become less. 03 villages is identified soil pH between 6.5 to 7.5.

Map No. 1.2. pH in Soil



The map no. 1.2 pH in soil is divided into three parts. One is pH between less than 7.5 which is found only in 03 villages in the tahsil. 03 percent area under this category was recorded. These villages is partially

irrigated namely karjgaon, Momin Akhada and Tamnar Akhada etc. The pH in soil between 7.6 to 8.0 is found in 26 villages in study area. It shows that 25 percent area is already facing a problem in soil. The above PH is found

in maximum area of Vambori and Taharabad division. Generally area under this division is unirrigated. At the same time, high pH is existing in 69 villages it acquired more than 71.76 percent area in the tahsil.

Electric Conductivity

In the soil, Electric Conductivity (EC) reading shows the level of ability. The soil water has to carry an

electric current. The EC levels of the soil water are a good indicator of the amount of nutrients available for crops to absorb. The salinity in soil affects the crop this soil is not good for crop. Generally on the maximum area sugarcane is cultivated from last 30 to 40 years, so the soil is becoming saline by over irrigation. It is main cause of Sugarcane failure in the study area.

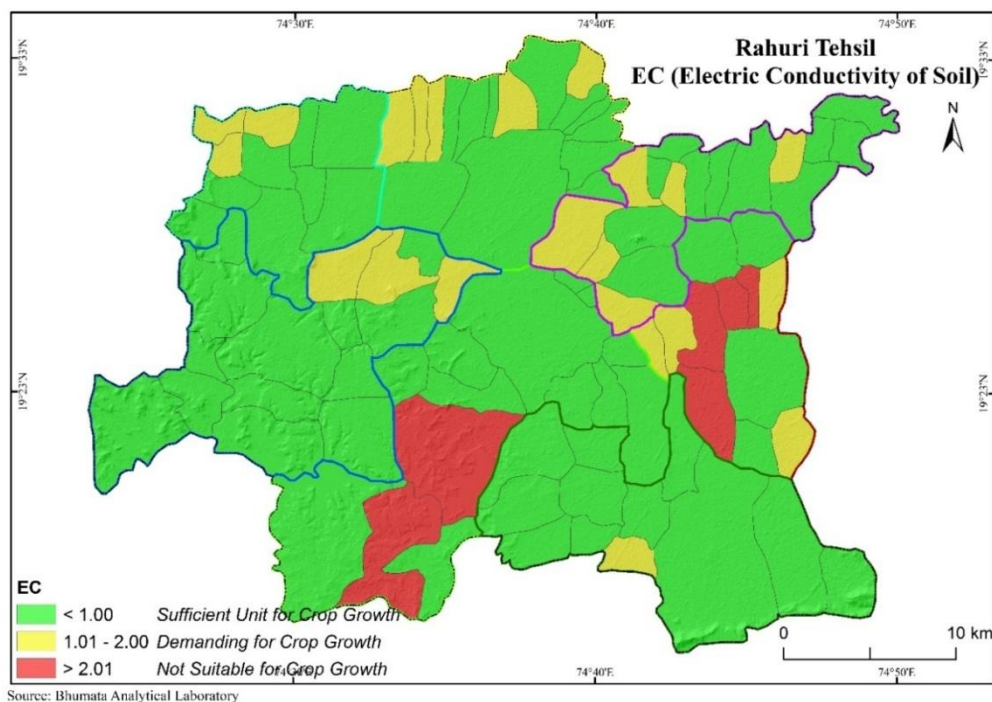
Table 2
Electric Conductivity

Sr. No.	Division	E. C. : No. of Villages			EC % < 1.00	EC % 1.01 To 2.0	EC % > 2.01	%	Total Villages
		< 1.00	1.01 To 2.0	> 2.01					
1.	Rahuri	12	00	02	85.71	00	14.29	100	14
2.	Deolali	11	05	00	68.75	31.25	00	100	16
3.	Satral	08	03	00	72.72	27.28	00	100	11
4.	Taharabad	13	03	00	81.25	18.75	00	100	16
5.	Vambori	11	01	00	91.66	8.33	00	100	12
6.	Bramhani	04	04	04	33.33	33.33	33.33	100	12
7.	Taklimiya	11	06	00	64.70	35.30	00	100	17
Grand Total :-		70	22	06	498.12	154.24	47.62	100	98
Average EC of study area: %					71.16	22.04	6.80	100.00	

The EC is found less than 1.00 in 71.16 % area of the tahsil. The EC between 1.01 to 2.0 is 22.04 % and more than 2.01 is found in 6.80 % area respectively. 6 villages acquire the maximum EC in study area. The medium EC is found in maximum villages at the river

bed of Pravara. 22 villages are found having medium EC, which is 1.01 To 2.0. Highly EC does not support to crop for its growth and production. It is found in 2 and 4 villages from Rahuri and Bramhani divisions respectively.

Map No. 1.3 EC in soil



The above map 1.3 shows the Electric conductivity of soils. In study area near about 70 villages found having less than one EC. It is sufficient for sugarcane cultivation. These villages located on the river Pravara basin. But the EC between 1.01 to 2.00 found in 22 villages. Only in 06 villages EC is more than 2.00. It is not suitable sugarcane in study area. Rahuri and Taklimiya divisions facing this problem.

soil. This mineral occupies near about 5 % part in the structure of soil. The formation of organic carb is depending upon vegetables leaf, waste material, crop and organic fertilizers given by farmers in whole year. The scale of OC in the soil is determined after testing soil in laboratory. If the OC is found in soil less than 0.5, the soil suggested low quality, but the EC is between 0.6 to 1.0 is medium quality and more than 1.1 is found good quality of soil. Organic factors create humus in soil which is important for high production.

Organic Carb

Organic Carb is a basic significant factor within

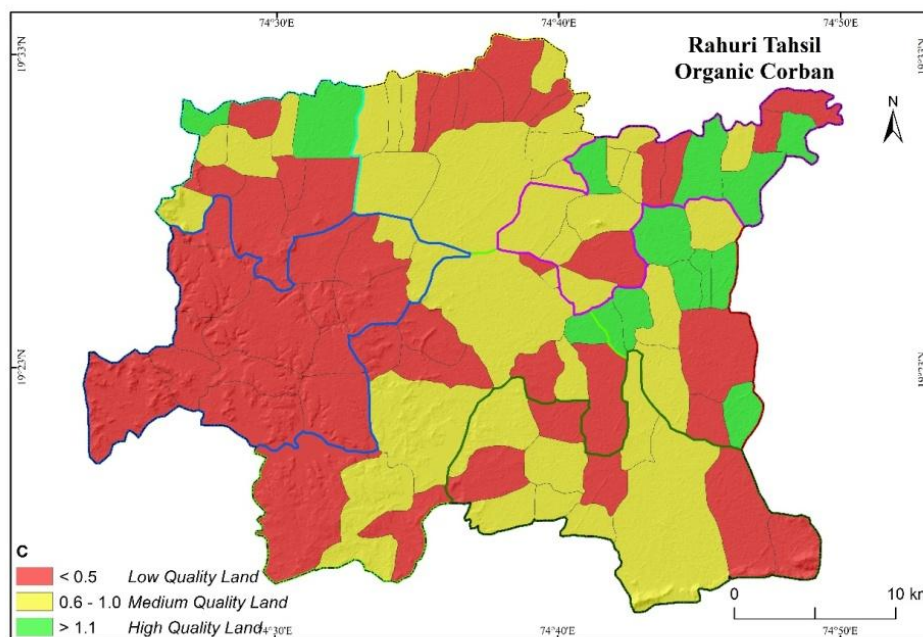
Table 3
Organic Curb

Sr. No.	Division	Organic Curb: No of Villages			OCE % < 0.5	OC % 0.6 To 1.0	OC % > 1.1	%	Total Villages
		< 0.5	0.6 To 1.0	> 1.1					
1.	Rahuri	05	08	01	35.72	57.14	7.14	100	14
2.	Deolalai	07	09	00	43.75	56.25	00	100	16
3.	Satral	04	04	03	36.36	36.36	27.28	100	11
4.	Taharabad	14	02	00	87.05	12.05	00	100	16
5.	Vambori	04	08	00	33.33	66.66	00	100	12
6.	Bramhani	01	03	08	8.33	25.00	66.66	100	12
7.	Taklimiya	03	07	07	17.64	41.18	41.18	100	17
Grand Total :-		38	41	19	262.18	294.64	142.26	100	98
Average Organic Curb of study area: %					37.50	42.12	20.38	100.00	

Organic Curb is always supports the sugarcane cultivation. According to table no. 4.4 It is found in three categories, One is less than 0.5 found 38 villages in study area and it is acquire 37.50 percent area. Organic curb between 0.6 to 1.0 is found in 41 villages which covered

42.12 percent area. Only 19 villages indicates that there OC is more than 1.1. Sugarcane cultivation requires mre OC for good growth and sufficient yield. The less amounts of OC is affects ratio of production.

Map 1.4 Organic Carb in Soil



Source: Bhumata Analytical Laboratory

The table No. 4.4 is indicated that the organic curb is found below 0.5 in 38 villages. But 19 villages shows it is more than 1.1 in study region. 37.50 percent area of the Rahuri tahsil is under 0.5 scale of the organic curb and 42.12 percent area cover under the range of 0.6 to 1.0. Only 20.38 percent area having more organic curb in Rahuri tahsil. Organic curb helps more area brought under sugarcane cultivation. According to map 4.3 maximum villages from Taharabad Vambori divisions have less range of organic curb, but the central area of the tahsil shows maximum organic curb in soil.

Conclusion

Over irrigation create a problem in soil health. Farmers used drip irrigation methods for better production with good soil. This problem is found averagely all villages in Rahuri tahsil. So this study is suggested that each farmer check their soil chemical characteristic and provide fertilizer as per requirement of crops.

Reference

1. K. Srivastava:(2008)“Sugarcane at a glance, International book distribution company Delhi, pp-6-10.
2. Kathe, Madhuri, (2013), “Thegeographical study of changes of sugarcane production in Junnar tehsil in Pune district” BhugolshtraSanshodhask, The Deccan Geographical Society, Pune. Vol. 8, Jan-dec. 2013, pp-11-18.
3. Mengade, N.K. (2009), “Performance analysis and management of Bhimashankar co-operative sugar factory, Bhimashankar, Dist.- Pune, Master of Science unpublished project submitted to Mahatma Phule Agriculture University, Rahuri. Pp-40-47.
4. Mane, Ankush, (2015), District Agriculture superintendent Officer, ‘Ahmednagar Soil health campaign” a research article published in daily newspaper Sarvmat 5 Dec. 2015, pp-1
5. O. D. Cheesman, “Environmental impacts of sugarcane production”, CABI, Bioscience, UK Centresurvey, U.K., pp-79-84
6. Pujari, A. A., (2013), “A geographical study of soil under sugarcane, BhugolshtraSanshodhask, The Deccan Geographical Society, Pune. Vol. 8, Jan-dec. 2013, pp-1-10.
7. R. S. Varma (2007,); “Sugarcane ratoon management’ Prin. Scientist, Indian institute of sugar research, Lucknow, International book distribution company, pp-28-33.
8. S. Soloman, “Sugarcane production management and agro industrial imperatives; Prin. Scientist, Indian institute of sugar research, Lucknow, International book distribution company, pp-167-174.