

# Electrical Conductivity and pH studies of Mula Command Soils from Khadambe, Rahuri Tehsil, Maharashtra, India

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## ABSTRACT

Soil and crop management can be easily achieved through measurements of soil electrical conductivity and pH as these are indicators of nutrient status of soil. Assessment of these parameters is an inexpensive method of soil characterization. Irrigation and cropping patterns affect the soil properties. In present study eight different fields from Mula Command area have been investigated for electrical conductivity and pH. The results of the pH study showed that soils are alkaline and electrical conductivity for most of the samples were within the normal range except soil A.

### Keywords:

**Introduction:** Soil and crop management is worldwide emerging aspect of agriculture. Physico-chemical properties of soil play an important role in agricultural production. Various parameters can be used to characterize the soil.<sup>1, 2</sup> Recently soil pH<sup>3-5</sup> and electrical conductivity measurements<sup>6-10</sup> have been used for characterization of soils. Measurement of EC and pH is an inexpensive and rapid way of monitoring the nutrient status of soils. These are the indicators of soil salinity and acidity. It has been proved that soil microorganism activity is affected by EC and pH of the soil.<sup>11, 12</sup> This in turn affects important soil processes like residue decomposition, nitrification, denitrification and respiration and ultimately the crop production.<sup>13</sup> Soil electrical conductivity and pH are mainly altered by irrigation and cropping pattern.<sup>14</sup> Maintaining optimum EC and pH levels can be applied effectively to sustainable or 'green' practices. Higher values of EC show the availability of nutrient salts in soil while lower values are indicators of deficiencies of nutrients. Availability of plant nutrients is also related to acidity of soil. At lower values of pH the solubility of Mn, Fe, Cu and Zn increases to toxic levels while the nutrients like N, K, Ca, Mg and S become less available. Thus these two parameters can be effectively applied for maintaining optimum nutrient levels of soil.

Use of synthetic and organic fertilizers helps to maintain EC and pH levels of fertile soils.<sup>15</sup> If the EC value is high then further fertilization is not required and if it is too high, then flushing with water becomes essential. Similarly if the reading is low, it indicates that the plant needs some supplementation of nutrients. Synthetic fertilizers will ionize into their constituent ions and will help to monitor the EC levels. Essentially, maintaining the proper EC levels prevents overfertilization. Thus electrical conductivity measurements can be used in nutrient management of soils.<sup>16, 17</sup> Similarly acidity of the soil can be reduced by application of lime and alkaline soils can be rectified by using nitrogen fertilizers.<sup>18</sup> In focus of this literature, in present investigation soil electrical conductivity and pH of Mula Command soils is reported.

## Material and Method

### Collection of soil samples

The topsoil samples were collected from eight fields of Mula command area of Khadambe, Rahuri tehsil of Maharashtra, India. The samples were collected from eight different fields of study area at 0-30 cm depth. All the samples were analyzed by known literature methods.<sup>19</sup>

### Results and Discussions:

The results of EC and pH measurements are given in **Table- 1**. In **Table -2** classification of soils based on these parameters is given.<sup>5</sup>

**Table- 1**

Sample	A	B	C	D	E	F	G	H
pH	8.54	8.70	8.45	8.67	8.67	8.45	8.49	8.48
EC (dSm <sup>-1</sup> )	1.18	0.74	0.64	0.45	0.57	0.74	0.55	0.69

Table -2

pH	Nature	Remedy	Ec(dSm <sup>-1</sup> )	Nature
<6.5	Acidic	Liming for reclamation	<0.8 dS m <sup>-1</sup>	Normal
6.5- 7.8	Normal	Optimum for most crops	0.8 – 1.6 dS m <sup>-1</sup>	Critical for salt sensitive crops
7.8 – 8.5	Alkaline	Application of organic manures	1.6 –2.5 dS m <sup>-1</sup>	Critical to salt tolerant crops
>8.5	Alkali	Gypsum for amelioration	>2.5 dS m <sup>-1</sup>	Injurious to most crops

### Conclusions:

The results of the study show that the pH of the soils is in the range of 8.45 to 8.70 which indicates the alkaline nature of the soils. Organic fertilizers can be applied to control the soil pH. EC values range from 0.45 to 1.18 dSm<sup>-1</sup>. Most of the soils are found to be normal with respect to EC except soil A. Soil A is critical for salt sensitive crops.

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