

# SOIL SALINITY REDUCTION BY BIOCOMPOST

<sup>1</sup>Meenal Sharma, <sup>2</sup>Dr. V.K.Srivastava

<sup>1</sup>M. Tech. Student, <sup>2</sup>Professor

<sup>1</sup>Department of Biotechnology

<sup>1</sup> R.B.S. Engineering Technical Campus, Agra, U.P. India

**Abstract :** Salinity is a major hassle in plant boom as well as in crop manufacturing. In India today 6788723 HA land are affected with soil salinity hassle and the goal of this study is to reduce the soil salinity. The results of salinity on plant boom control practices can save the soil from this salinization hassle. The method of controlling the salinity of soil by means of the use of bio-compost, we've got changed the soil by way of a longtime soil hydrology version to expect the electrical conductive (EC) of soil- compost mixture of a slandered soil (MS-0) and saline soil (MS-1 and MS-2). This paper covers the studies of one acknowledged soil which does not have any sort of salinity and saline soil of different regions which each have a few quantity of salinity in it. We prepared the solution of NaOH for slandered soil and saline soil, through the usage of the electric conductivity meter we've got obtained the initial values after the preliminary fee we added the bio compost. On adding the bio compost step by step the salinity reduced which become measured by means of EC meter. This paper finish that the bio-compost is the first-class, cheap, clean to use as well as the most sustainable approach to lessen soil salinity in farmland.

**Index Terms:** Salinization reduction, Bio-compost, Soil hydrology, Electrical conductivity.

## I. INTRODUCTION

Soil salinity is the salt substance in the soil the manner towards increasing the salt substance is known as "Salinization". Salt occurs in typically interior soils and water. Salinization may be delivered approximately with the aid of function methods, e.g. mineral enduring or by the revolutionary withdrawal of a sea. The beginning of twenty first century is ready apart through global shortage of water property, ecological contamination and increased salinization of soil and water. Distinctive ecological burdens viz. Excessive breezes, remarkable temperatures, soil saltiness, dry spell and flood have motivated the advent and development of agrarian harvests, some of the dust saltiness is a standout among the maximum decimating natural anxieties, which causes vast decreases in evolved land area, crop profitability and first-rate. Soil salinity is many of the maximum essential burdens ordinary diminishing plant improvement and agrarian generation.

The measure of arable land on the planet is equivalent to 1. Five billion hectares, of which 77 million hectares are inadmissible for yield improvement because of excessive saltiness. The salinity of soil alludes to the measure of salts inside the dust and it tends to be assessed with the aid of estimating the electric conductivity (EC) of an extricated soil. Soil salinity is a tremendous difficulty for horticulture underneath water machine. Within the hot and dry districts of the sector the soil are as regularly as viable saline with low rural capability. The territory underneath the influenced soils maintains on increasing every year because of presentation of water gadget in new regions. The overall effect of salinity is to decrease the improvement charge bringing about littler leaves, shorter stature, and now after which less leaves.

## II. MATERIAL AND METHODS

The approach of improvement of the model for discount of the soil salinity from salinity location in Agra with the use of bio-compost in addition to estimating the awareness of salinity in soil the usage of electric conductivity.

### 2.1 Preparation of Bio-compost

The compostable materials were split into chunks of ½ inch to 1 ½ inch. Smaller substances of compost covered these materials with a layer of green nitrogen-wealthy substances including grass clippings and

kitchen scraps. After proper starting these were stored in big ones. Moistened the compost-desk materials for about 50% moisture content. The substances have to be calmly unloaded however not saturated. From Day 5<sup>th</sup> to 9<sup>th</sup> : turn the compost pile daily with a shovel, shifting cloth from the bin's area's toward the centre take a look at the moisture level of the pile after flip it and spray with water if needed. Preserve the compost up to an internal temperature of 160°F, which it must obtain within 24 to 48 hr. From Day 11<sup>th</sup> to Day 18<sup>th</sup> the compost was preserved to observe every 2<sup>nd</sup> day. Simply heat, dark brown, smells precise. While earthworms flow into the compost, its miles known as it's far a completed and ready, because it is cooled down and complete of nutrient. The specification of final compost is shown in Table-1.

## 2.2 Collection of soil sample

One Kg composite samples from two soil pattern were taken in plastic packs of one Kg restriction by means of quartering approach taken in crisscross alongside diverse segments of the quarter till the complete territory become secured. The whole of composite example is spread in a uniform way and retain quartering and taking nook to corner quarters disregarding the other also till roughly two hundred gm soil take a look at is gotten. The pattern is sifted through a 2 mm plastic sifter. One Kg sifted soil check changed into placed away is pot less polythene pack with legitimate naming for examination.

Slandered Soil (MS-0) collected from farm house of R.B.S. College, Bichpuri (Agra) and Soil samples collected from Akola (MS-1) & Kheragarh (MS-2)

## 2.3 Soil Texture Analysis "The Jar Test"

To assess soil ground, make use of a truthful container take a look at to decide the charges of sand residue, and dust. The use of a bit strainer or vintage colander, clear out the dust to evacuate any flotsam and jetsam, rocks, and big natural issue (leaves, sticks, roots etc). Filled the field  $\frac{1}{3}$  loaded with the dirt to be examined. Filled the rest of the container with easy water, but abandon a few areas at the pinnacle. Consist of 1 tablespoon of powdered dishwashing purifier. Top the container and shake enthusiastically till the dust transforms into uniform slurry. Four set on a dimension floor and time for one moment.

1. Spot an imprint the outdoor of the box, acting coarse sand layer settled at the bottom of the container.
2. Leave the jar in a level spot for 2 hours.
3. Depart the field on a size spot for 24 hours.
4. Imprint the very best point of the subsequent settled layer with the indelible marker. This is the mud
5. Layer that has settled over the sediment layer.
6. Utilizing a ruler, degree and file the stature of every layer, and the all out tallness of every one of the 3 layers. Utilize the dust floor examination worksheet below to record results.
7. After the jar take a look at the size was calculated for each regarded and soil. (slandered soil fig.1 and for saline soil fig.2 to 3)

## 2.4 Soil salinity measurement

Soil salinity may be examined easily and inexpensively. To affirm a capacity salt trouble, soil analyses are had to determine the level of saltiness & the sort of salt concerned. The electrical conductivity ( $EC_e$ ) indicates the quantity of soluble (salt) ions in soil.

Electrical conduction was used for obtaining the initial reading of saline soil salinity in the solution and slandered soil solution and after the initial value the bio-compost was adding in the sequence form and the salinity in the solution were gradually decrease by increasing the amount of bio-compost (g).

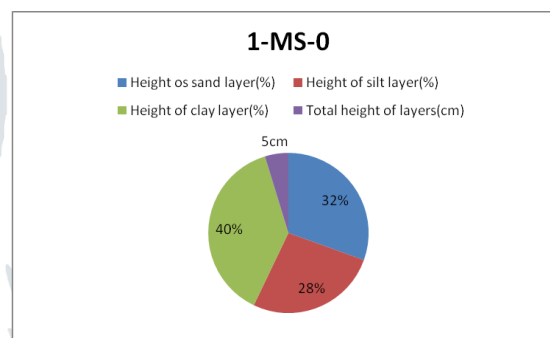
## III. RESULT AND DISCUSSION

The reduction of soil salinity was done for the samples collected from saline place of Agra with the usage of bio-compost. The parameters observed for bio-compost is given in Table 1.

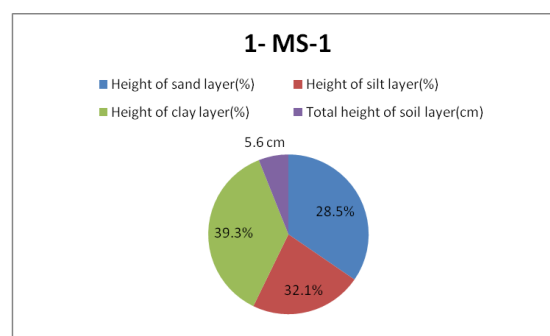
**Table1:** Parameters of bio-compost

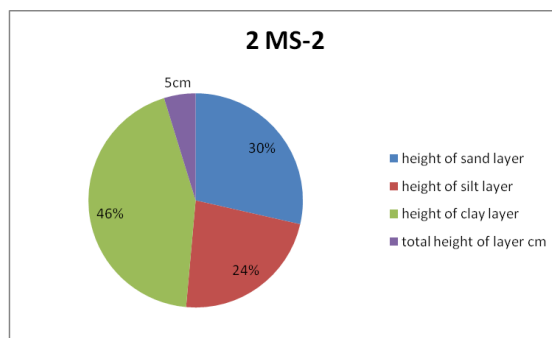
S.No	Parameter	Bio-compost
1.	Colour	Black colour, Dark coffee brown.
2.	Odour	Unpleasant
3.	pH	7.4
4.	EC(dS m <sup>-1</sup> )	0.16
5.	Moisture content	40%
6.	Temperature	70 °C

The results of jar test for texture analysis of slandered soil is summarized in figure 1 in which the of sand layer, silt layer , clay layer exhibited as 32%, 28% and 40% respectively. the total height of soil layer was 5.0 cm.

**Figure 1:** Jar test for texture analysis of slandered soil

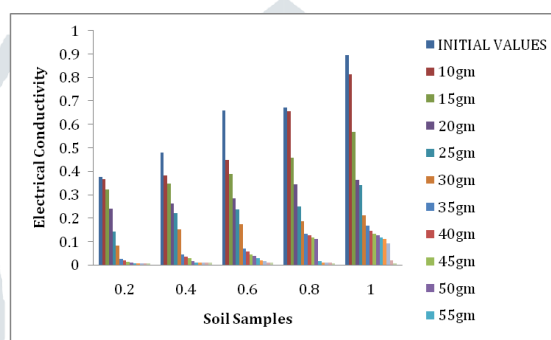
The jar test for texture analysis of MS-1 & MS-2 sample is summarized in figure 2 & 3. MS-1 was exhibited sand layer, silt layer, clay layer as 28%, 32.2% and 39.3% respectively while in MS-2 the sand layer, silt layer, clay layer was 30%, 24% and 46%. The total height of soil layer in MS-1 & MS-2 was 5.6 and 5.0 cm respectively.

**Figure 2:** Jar test for texture analysis of slandered soil



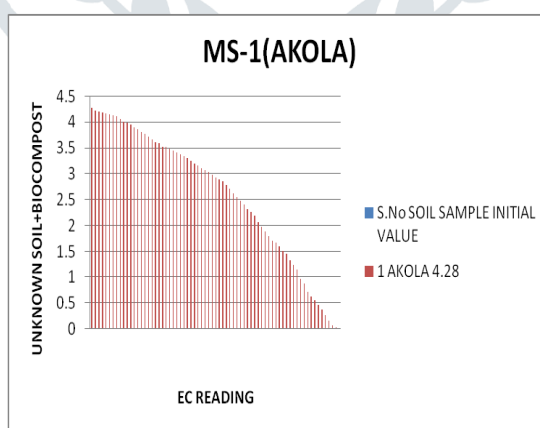
**Figure 3:** Jar test for texture analysis of slandered soil

The standard soil was prepared by adding the known amount of 0.2% to 1% NaOH in 50 gm normal soil in 50 ml of DW. The bio-compost was added starting from 10g with an increment of 5 g until the salinity become minimum. With the addition of 75 g of bio-compost the electrical conductivity exhibited minimum. Further addition of bio-compost the electrical conductivity was unaffected. The result is summarized in Figure 4.

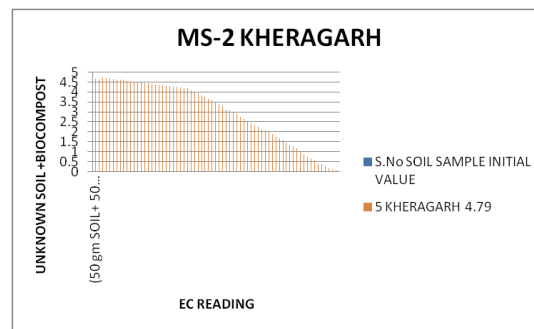


**Figure 4:** Reduction of soil salinity in standard soil sample (MS-0)

The saline soil MS-1 and MS-2 was prepared by adding the 50 gm saline soil in 50 ml of DW. The bio-compost was added starting from 2g with an increment of 2g until the salinity become minimum. With the addition of 140 g of bio-compost the electrical conductivity exhibited minimum. Further addition of bio-compost the electrical conductivity was unaffected. The result is summarized in Figure 5-6



**Figure 5:** Reduction of soil salinity in soil sample of Akola (MS-1)



**Figure 6:** Reduction of soil salinity in soil sample of Kheragarh (MS-2)

#### IV. CONCLUSION

Bio-compost amendments along with farm manure, compost and press mud might be effective in enhancing plant growth. In saline soil, organic amendments provide critical nutrients and help to growth the leaching in addition to washing of salt out of the soil. In this observe we've got reduce the soil salinity from the best value stage  $E_{Ce}$ -4.79dS  $m^{-1}$  to the lowest value level become  $E_{Ce}$ - 0.02 dS  $m^{-1}$  by using the use of bio-compost at 140gm in saline soil and in acknowledged soil the highest value of salinity became  $E_{Ce}$ -0.896 dS $m^{-1}$  to lowest value  $E_{Ce}$ -0.005dS  $m^{-1}$ .

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