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Compost Role in the Reducement of Saline Soil in Agra Region

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Abstract: This report deals with this analysis “Bio-Compost Influences Salinity and Plant Development by Experimenting with Greenhouse Pots” [1] and “Soil salinity reduction by bio-compost” [2]. The soil salinity is the phenomena in which the salt contents are elevated from normal value. The process in which the salt content is increase is termed as salinization. Salts occurs normally inside soils and water. Salinization can be established. By characteristic procedures, e.g. mineral enduring or by the progressive withdrawal of an ocean. It can also come into existence with artificial irrigation and the excess use of chemical fertilizers in farmland. Salinity is a major crisis in plant growth as well as in crop production. In this project aims to study the effects of salinity on plant growth along with how the management practices can prevent soil from problem of salinization. The compost was used to minimize the soil salinity. With the use of bio-compost, Agra's estabilized soil hydrology model was reduced. Electrical conductivity (EC) of the compost mixture of soil samples, i.e. MS-2 . The study findings indicate that compost has a great potential to decrease soil salinity and could be a highly potent alternative to chemical fertiliser and increase plant growth.

Keyword: Soil salinity, Salinization, Electrical conductivity, Compost, Reduce soil salinity.

I. INTRODUCTION

Soil salinity is the word use to elevate salt substances to this occurrence. Has always been referred to as salinization. The saltiness of the soil can be affected as economic and environmental triggers by humans. The situation in which the salt material turns out to be big, the dirt results as sodium soil, and when used as a production basis, can cause countless problems.(Pooja Shrivastava 2015)

Salinity is another problem. Saline waters involve big quantities of sodium on a regular basis. The salinity will display high in water testing with EC (electrical conductivity). OSMOSIS transfers water from dirt into plant tissues. If the dirt and soil water contain salt, the salt in the dirt / water pushes the water back on itself. As a result, the saltier the mud

or soil-water, the worse the water the plant absorbs and the plant obstructs. The global key issue is the total global shortage of water resources, economic and environmental pollution and extended soil and water salinization. Two challenges to agricultural sustainability are the rise of the human population and the decline in land available for growth. Chemical fertilizer, the soil arising from soil salinity owing to sewage irrigation, is a severe problem Because of the possible health effects of the consumption of polluted goods and the increasing production of crops due to excess salt in the soil.(Stefan D. Kalev 2018)

II. METHOD AND MATERIAL

The technique of decreasing soil salinity in extremely saline soil in the Agra area and crop development in agriculture due to saline soil is declining day by day. The compost has been applied to saline soil from different fields of Agra. (AICRP - SAS & UAS)

A. Sample Collection of Soil

A soil sample was obtained by representing the region or portion of a field. Obtaining valuable data on a field to make soil management decisions. Uniform fields can be sampled uniformly over the entire field, avoiding field corners. The composite sample was distributed as dried air and material that was not essential. 100 g sample of soil from three distinct areas was gathered and packaged in plastic bag.(R.B SINGH (Soil Chemist) . Field areas for soil sampling like;

1) Bichpuri (MS-2)

B. Composition of Compost

The compost bin must be at least 35 inches wide by 36 inches tall or 3 cubic feet in volume. Set up the compost bin in a sunny area near a water source. The compostable materials were divided into 1 inch to 2 inch sections. These materials were enclosed with a layer of green nitrogen-rich substances, including grassland trimmings and kitchen waste, by small compost substances. After accurate staring these were stored in big ones. Moisten the compost desk materials for concerning 40% moisture content. The substances have to be cool but not saturated.

From Day 6th to 10th : Every day, rotate the compost pile with a shovel, move the cover from the area of the bin in the direction of the middle, take a look at the pile's moisture level after spinning it and sprinkle it with the required water. Keep the compost at an internal temperature of 150-160°F, which must be collected within 24 to 48 hours. From Day 11th to Day 18th the compost was conserved to observe every 1st day. Simply warm, dark coffee color, smells unpleasant. While earthworms moving into the compost, its miles known as it's far a finished and ready, because it is cooled down and complete of nutrient.(Hot composting 18 days (deep green perm-culture) composting.

C. The Jar Test for soil sample

The jar test for soil sample figure out the percentages of clay, silt and sand in saline soil sample. .(Andrew "Drew" Jeffers 2013)
Fill glass jar half full of soil sample and adding water but leave space at the top of the jar, mixing one table spoon of detergent which help to clear the layer in the jar. After adding the composition jar would be tighten. Shake the jar completely. Wait for 24 hr for settlement of layer and start marking as well as measuring the layer by layers for calculation.(Shelly McRae 2017)

D. Measurement of Soil Salinity

Soil salinity can be tested easily and inexpensively. Soil tests are required to determine the degree of saltiness & the type of salt involved to verify a potential salt problem. Checking with a sampling of the site via it. To reflect the 6"-12 "depth, get a representative soil sample from the upper 6 inches & another sample. There are several measures to measure or determine the saltiness of the soil. The degree of soluble (salt) ions in the soil is indicated by electrical conductivity (ECe). Following the initial value added by the bio-compost in the sequence form, electrical conductivity was used to obtain the initial reading of the saline soil salinity in the solution and the salinity in the solution progressively decreased by increasing the amount of compost (g).(David M. Crohn et.al (2012)

III. RESULT AND DISCUSSION

The degradation of organic matter by the action of microorganisms, bacteria and fungi that function best under certain conditions is the reduction of soil salinity from the salinity zone in Agra by the use of compost composting. In order to decompose the organic matter and good aeration, they need humidity as they need certain requirements, such as :pH, temperature, colour, odour, EC, moisture content.

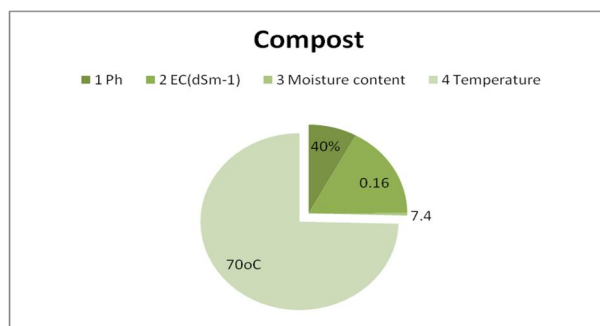


Figure 1: Specification of compost

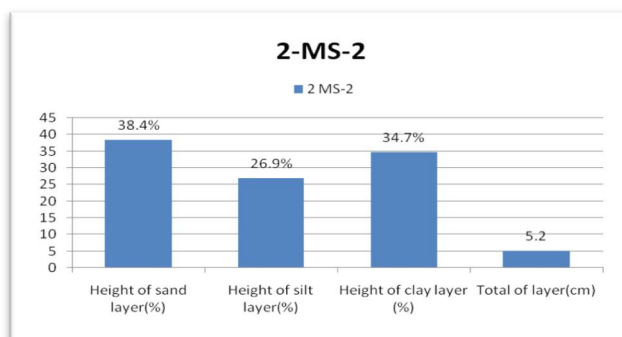


Figure 3: layer testing of MS-2

The result of soil salinity measurement we have adding 50g of saline soil in 50ml of distilled water of each MS-2. To make a solution for testing, After making the solution of saline soils the initial readings of the soil solution on tested by the electrical conductivity meter. After the initial value of 2 g, compost was applied with an increase of 5 g until the salinity was reduced. The minimum electrical conductivity, with the addition of 140 g of compost, is. Fig:3

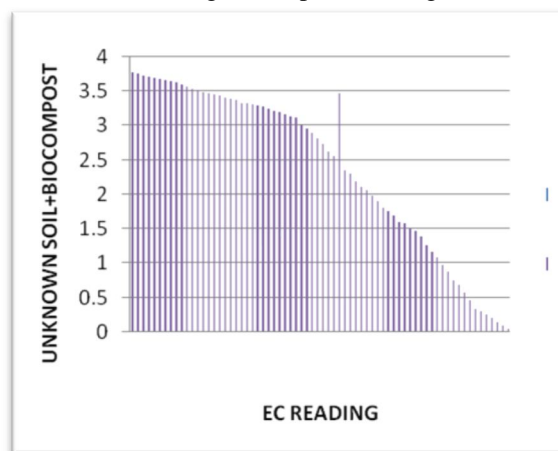


Figure 5: Decrement of soil salinity MS-2

IV. CONCLUSION

Framers practicing wheat system in Agra(U.P) and particularly and elsewhere in the world generally having similar climatic and soil salinity condition. The compost are recommended because the compost is the best as well as the most sustainable way to reduce the soil salinity by converting the bio-waste into compost. In this study we have reduce the soil salinity from the highest value level MS-2-3.79 dSm⁻¹ to the lowest value level was MS-2-0.05dSm⁻¹ by the use of compost at 140gm.

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