

Cow Dung for Improving the Ph of Highly Alkaline Soil and Indian Cow Importance from Vedic Scriptures

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Abstract: *The population is increasing day by day and in order to meet the demand of population, industries are increasing their production capacities and simultaneously some industries are polluting the environment by releasing waste in environment without treating them and eventually affecting the ecosystem as these untreated waste pollutes not only pollute water but also pollutes groundwater, land and air also and if it enter the plants through roots than it enter the food chain and ultimately affecting all the members of ecosystem. The soil samples of one types was collected from college campus only and with the aim to improve the manually contaminated soil samples by alkaline water, cow dung was used for treating those polluted samples. These soil samples were analyzed at laboratory to observe the role of Indian Cow dung in improving polluted soil. In soil samples collected from college campus only basic water was added and effects on electrical conductivity and pH of that polluted soil samples was measured. The pH and electrical conductivity of that polluted soil samples was measured on addition of Indian cow dung after 15 days and 40 days. The Ph lowered to much great extent. The historical importance of Indian Cow and her effective utilization of panchgavya (mixture of urine, milk, ghee, curd and dung of Indian Cow) and individual products mentioned in various vedic book like Bhagwat Geeta, Mahabharat, etc was studied which was suggested by the known holly persons who were using cow dung as a medicine, as a thermal insulator, as a plaster, flooring etc. The experimental observation showed that there is a effective decrease in soil Ph value. So, utilization of cow dung helps in improvement of soil properties.*

Keywords: population, industries, wastewater, ecosystem, basic water, soil samples, cow dung, Ph, electrical conductivity.

1. Introduction

The land, ground water and surface water all are very important in maintaining ecosystem and if any one of them is polluted it's pollutes the environment. Now suppose land is polluted with some pollutants like pesticides than it is further consume by plants which in turn consumed by animal and human being thus entering the ecosystem which will further introduce problem of decrease in immunity of human being. Hence due to decrease immunity chances of people being affected by diseases increases and for that best example is that of Bhopal gas tragedy. In this tragedy methylisocyanate (MIC) gas was released which was toxic in nature which kills many peoples. [1]

If we live in peace and harmony with nature the nature will give us positive result. For example with the organic fertilizers soil fertility also increases but also various other properties of soil like water holding capacity, porosity, softness, etc increases for longer duration but with chemical fertilizer productivity is high but quality of food grains, fruits, etc is less as compared to organic fertilizers applied soil. So human activities motives should have consideration for environment protection also which will have good result in future for future generation. For example for treating any polluted medium the treatment should consider maximum portion of bioremediation as it not only helpful for protection of environment but also helpful for maintaining ecosystem. [2]

Cow dung is very helpful as micro organisms present in Cow dung are helpful for decreasing the value of total petroleum hydrocarbons and also helps in improving the soil properties like pH and electrical conductivity. This technology not only decreases the amount of pollutants in soil but also helpful in increasing nutrients of soil as well as helpful in enhancement of soil properties like water holding capacity, softness etc for enhances growth of plant. [3]

Panchgavya meaning mixture of mixture of urine, milk, ghee, curd and dung of Indian Cow. It is used for treatment of diseases like cancer, skin diseases, etc. [4]

Finally it can be said that cow plays important role in protection of environment.

2. Literature Review

Indian cow is of great importance in Indian society. Indian cow is considered as holy since ancient time. Its dung is known as best manure and best soil fertilizers throughout the world. Indian Cow has been considered as symbol of wealth since ancient time. The crop grown in soil which has used cow manure have high yield and have better quality grains as compared to artificial manure. In this research property of soil was checked before and after adding of cow dung.

P. Agamuthu, Y.S. Tan, S.H. Fauziah (2013): Have discussed that the cow dung can play an important role in treatment of

soil polluted with lubricant oil and concluded that bioremediation can play an important role in treating soil polluted with petroleum hydrocarbon. [5]

Uwumarongie-Ilori, E.G Aisueni N.O, Sulaiman-Ilobu, B.B ,Ekhaton, F. Eneje, R. C. and Efetie-Osie, A. (2012): They have discussed that in cases of metal contamination ,accumulation of heavy metals from regular application of inorganic fertilizer to soils cultivated with oil palm, cow dung can be used to immobilize the heavy metals in the contaminated soil. [6]

K. Prapagar, S.P. Indraratne and P. Premanandharajah (2012): The study revealed that addition of gypsum and organic amendments (CD, PH) acted as ameliorant to saline-sodic soils. It also revealed that individual or combined effect of gypsum and simple leaching was more effective in changing EC and SAR. Gypsum application in combination with organic amendments improved the soil chemical properties by reducing the EC, SAR (Sodium Adsorption Ratio) and pH, than the applying gypsum alone. [7]

P. M. V. Subbarao and V. K. Vijay: They have discussed the importance of cow dung in production of biogas which can be used for running vehicles after removing carbodioxide from biogas.[8]

Now days living creature's likes animals, birds, etc are on the verge of extinct which helps in maintaining the ecosystem. For example cows which plays very important role in protection of environment as they feed on the dry and wet both grasses and helps in solid waste management. They also provide with milk, and from that milk ghee, curd, etc are produced which provide the human being with good variety of food.

3. Materials, Equipments, Method

Soil samples, plastic pot, basic solution prepared from NaOH pellets, distilled water, pH meter, fresh cow dung, electrical conductivity instrument, chemical required for testing pH and electrical conductivity of soil and plastic samples bottles were required for doing experiment.[9]

From the college campus only red garden soil was taken and in 5 plastic pots 2 kg each soil was taken and in five plastic pots samples basic water of Ph 13 was added and immediately small amount of soil was taken for measuring pH and electrical conductivity and then cow dung was added in succession of 200g, 400g, 600g, 800g and 1000g in basic soils plastic pots and than after 15 days and 40 days soil Ph and electrical conductivity was measured.[10]



Figure 1: Plastic pot containing basic solution added soil



Figure 2: Plastic pot containing base added soil with cow dung added



Figure 3: Plastic pot containing base added soil mixed with cow dung

4. Result and Discussion

In this as soil is basified by NaOH solution than on addition of cow dung there is decrease in pH value which shows that cow dung can be used in treatment of basified soil when some industries directly discharge there basic effluents on soil which result in pollution of soil. In this test initial soil Ph was 6.02 and electrical conductivity was 0.117 Ms/cm and afterward when basic solution was added in order to pollute the soil which increases the pH up to 8.25 thus making the soil more basic in nature which is harmful for normal plant growth and but on addition of cow dung 15 days pH values of each soil samples decreases and it further decreases after 40days which shows a positive sign of soil improvement. Thus it can be concluded that cow dung can be used in treatment of highly basic or alkaline soil. Hence with the research work done it can be concluded that cow dung can be used for protection of environment.[13]

Table 1: ph and Electrical conductivity of bacified soil samples after addition of cow dung after 15 days

| Bacified Soil Ph = 8.25 and EC =0.221 | | | | |
|--|-------------|-----------------------|------|---------------------------------------|
| ph and Electrical conductivity of soil after addition of cow dung after 15 days | | | | |
| Sr.No | Sample Name | Cow Dung Added (gram) | Ph | EC(Ms/cm) milliSiemes / centimeter |
| 1 | BAS1 | 200 | 8.02 | 0.642 |
| 2 | BAS2 | 400 | 8.05 | 0.74 |
| 3 | BAS3 | 600 | 8.22 | 0.956 |
| 4 | BAS4 | 800 | 8.28 | 0.79 |
| 5 | BAS5 | 1000 | 8.31 | 1.376 |

Table 2: ph and Electrical conductivity of bacified soil samples after addition of cow dung after 40 days

| Bacified Soil Ph = 8.25 and EC =7.75 | | | | |
|--|-------------|-----------------------|------|---------------------------------------|
| ph and Electrical conductivity of soil after addition of cow dung after 40 days | | | | |
| Sr.No | Sample Name | Cow Dung Added (gram) | Ph | EC(Ms/cm) milliSiemes / centimeter |
| 1 | BAS1 | 200 | 7.78 | 0.498 |
| 2 | BAS2 | 400 | 7.91 | 0.622 |
| 3 | BAS3 | 600 | 7.92 | 0.314 |
| 4 | BAS4 | 800 | 8.06 | 0.509 |
| 5 | BAS5 | 1000 | 8.09 | 1.079 |

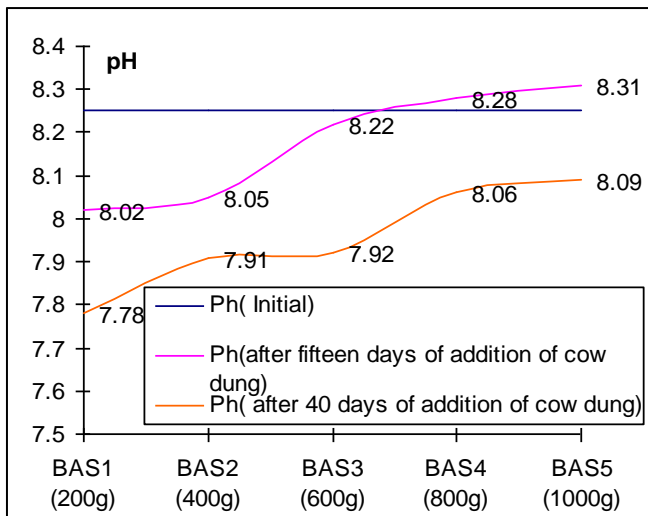


Figure 4: Chart showing effect on pH of 5 basified soil samples before polluting, after polluting and after treating

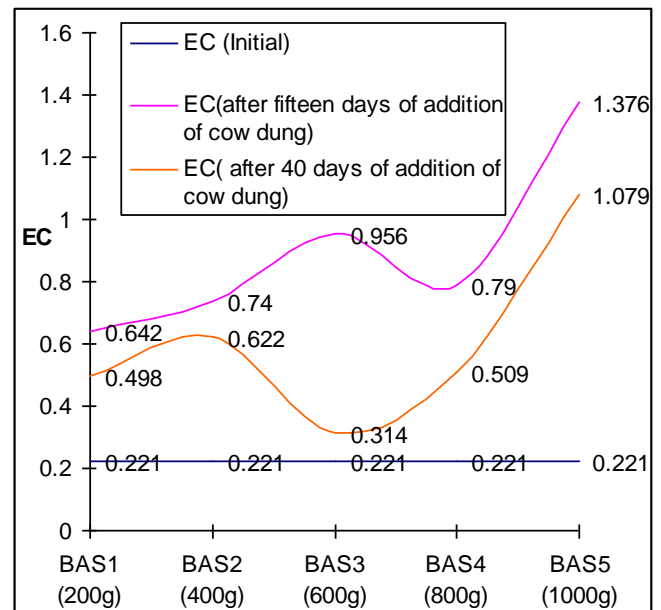


Figure 5: Chart showing effect on electrical conductivity of 5 basified soil samples before polluting, after polluting and after treating

5. Importance of Cow from Vedic Scriptures

Krsi-go-raksya-vanijyam vaisya-karma svabhava-jam

The Supreme Personality of Godhead has instructed in the Bhagavad Gita, "Farming, Cow Protection & Trade are the natural work for the vaisyas. - Bhagavad Gita (18.44). These words state it is the duty of business class people and farmers

to protect cow which is said by the Supreme Personality of Godhead. [11]

Obstructing provision of water to thirsty cows should be considered equal to the sin of killing Brahmins which is stated in Mahabharata, Anushasana Parva 24-7 which convey us that if we are not providing water to thirsty cow than it will be equal to the sin of killing of Brahmins or holly person. [12]

Caitanya Mahaprabhu confirms:
go-ange yata loma tata sahasra vatsara
go-vadhi raurava-madhye pace nirantar

Cow killers and cow eaters are condemned to rot in hell for as many thousands of years as there are for each hair on the body of every cow they eat from. In this verse the importance of cow can be understood that if we kill cow than we have to live for long span in hell.[13]

6. Conclusion

It can be concluded that cow dung helps in decreasing the ph of highly alkaline soil, ultimately helps in treatment of polluted soil. The research work presented here comprises literature review on importance of cow dung used for treating polluted soil, and its uses in civil industry as a construction material. So, bioremediation methods should be explored as Indian cow is of great importance in Indian society and is considered as holy since ancient time. Its dung is known as best manure and best soil fertilizers throughout the world. Indian Cow has been considered as symbol of wealth since ancient time. The cow dung remediation for polluted soil is not only beneficial to farmers but also beneficial to that those people who want to live in harmony with nature. It is an eco-friendly method of treatment which is cheaper one. Cow dung is used for biogas manufacturing, plastering, sacred ceremonies, etc.

Acknowledgement

This study is a part of use of ecofriendly material for treatment and hence further research should be done in field of bioremediation for treatment of soil. The authors are grateful to God for his providence. The authors are also grateful to Principal Dr. S.B. Thakare of ABMSP'S "Anant Rao Pawar College of Engineering And Research" Pune, for their supports and valuable guidance in our paper. The author is grateful to HOD Prof. S.M. Gawande of Civil Environmental Engineering Department for his valuable support. Last but not the least authors are grateful to management staff, College Staff members, Peons, etc for their supports in our project as well as paper.

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Author's Profile



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