

A Study on the Impact of Poly mixed Activated Sludge generated From STP Based SBR Technology

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Abstract— In Recent Year, In India there are many new technologies are introduced for the treatment of Waste Water. As the consumption of water increases due to increase in population has increased the amount of waste water and sludge. Here in this article we will focus on dry Activated sludge coming from process of Dewatering method from Centrifuge Machine and used as manure for horticulture. Sequencing Batch Reactor is the process which is used for waste water treatment for better water quality. As it was introduced in India since 2002, One of the crucial question in this technology is weather dewatered sludge can be used as a manure as it contains Cationic Poly Electrolyte Molecules that are used to separate the solid from liquid. Farmers who are generally depend upon the Manure for their rapid growth of plant can be useful for them and easily availability with low price Sludge Available from STPs.

Poly electrolytes are polymers whose repeating units bear an electrolyte group. Poly cations and poly anions are poly electrolytes. Here for our experiment we are using Poly Grade ZETAC 8125 From BSF Product. These groups will dissociate in aqueous solutions (water), making the polymers charged. Polyelectrolyte properties are thus similar to both electrolytes (salts) and polymers (high molecular weight compounds), and are sometimes called poly salts. Like salts, their solutions are electrically conductive. Like polymers, their solutions are often viscous. Charged molecular chains, commonly present in soft matter systems, play a fundamental role in determining structure, stability and the interactions of various molecular assemblies.

Same answer has to be found in this article so that waste treatment plant based on new technology must be far better with the convectional technology used in India.

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I. INTRODUCTION

Sewage sludge is a solid, semisolid or liquid waste obtained from the treatment of wastewater and is composed of microorganisms which remove organic matter from wastewater which use as food. Sludge is important source of nutrient as it contains micronutrients such as Nitrogen, Phosphorus and Potassium. Nitrogen is a part of all living cells and is a necessary part of all proteins, enzymes and metabolic processes involved in the synthesis and transfer of energy. Nitrogen is a part of chlorophyll, the green pigment of the plant that is responsible for photosynthesis. Potassium is absorbed by plants in larger amounts than any other mineral element except nitrogen and, in some cases, calcium helps in the building of protein, photosynthesis, fruit quality and reduction of diseases. Phosphorus (P) is an essential part of the process of photosynthesis.

II. Methodology

- Soil was Prepared with dry sludge manure about a week before planting.
- After a week seeding done with atmosphere temperature 35° C and Approx 70° F.
- Daily watering done in all three pots.
- Firstly We took 5KG Soil equally weight of Sample in all 3 nos of Pots, Soil nature is Sandy and seeds taken from North East Seeds University Road, Near LIC Building, Bangalore (Karnatka State) India.
- Poly Mixed Sludge taken from Running SBR Plant taken as manure.
- Sludge Taken From 33 MLD STP Centrifuge Machines.
- Firstly, 20 nos of seeds taken in all three individual pots. In first Pot Sand Sample taken as a pure Soil media and in it no activated sludge adde.
- In Second Pot, only the dry Activated Sludge Sample used with Soil.
- For making 0.1 N Poly Electrolyte Solution, Approximately 100 ml of the sludge samples were placed in which 1 mg of Poly Electrolyte Cationic dose given and settlement was observed as a dry solid.

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- Dry solid was put in Oven at 105 ° C. After Drying, Dry Sludge used in a third Pot as manure.

III. RESULTS

After a week seed sprout up to 1 cm of growth shown in 3rd pot. Another 10 days, First Pot shown no result and second one shown 2 cm growth and third pot shown 4 cm growth. Water regularly poured in all three numbers of pots.

In first Week Growth, In First Pot showed no growth found in it. In Second Pot Plant Growth showed as it Height extend up to 0.25cm and leaf width 0.30cm. In Third Pot Plant growth shown its Height up to 0.5cm and leaf width 0.25cm.

In Second week Growth, In First Pot Showed Spinach height up to 0.25cm and leaf width 0.30cm. In second Pot spinach plant height showed up to 0.5cm and leaf width 0.25cm. In Third Pot spinach plant shown 0.5cm and leaf width 0.25 cm.

In Third Week Growth, In First Pot Showed Spinach Height upto 1.0cm and leaf width 0.55cm. In second Pot Spinach height found 5 cm and leaf width 1 cm. In Third Pot Spinach Plant height found up to 7cm and leaf width 1.8cm.

In Fourth Week Growth, In First Pot showed Spinach height up to 1.8cm and leaf width 0.7cm. In Second Pot Spinach Plant height found up to 9cm and leaf width 1.2cm. In third Pot Spinach plant height found 12 cm and leaf width found 2.5cm.

Table 1- Comparison of Three Spinach Plant Growth using Activated Sludge.

		No. of Live Plants	1 st Week Growth	2 nd Week Growth	3 rd Week Growth	4 th Week Growth
1	Spinach Plant Growth with No Sludge	2				
	Plant Height		NIL	0.35cm	1.0 cm	1.8cm
	Leaf Width		NIL	0.15 cm	0.55cm	0.7cm
2	Spinach Plant Growth with Activated Sludge	13				
	Plant Height		0.25	1cm	5 cm	9cm
	Leaf Width		0.30	0.5cm	1 cm	1.2cm
3	Spinach Plant Growth With Poly mix Activated Sludge	16				
	Plant Height		0.5cm	1.2cm	7cm	12cm
	Leaf Width		0.25cm	0.7cm	1.8cm	2.5cm

CONCLUSION

In the period of 1 month Experiment on Spinach Plant, It was found that the growth is almost 70 % found with the Poly mixed Activated Sludge and Activated Sludge. Pure Soil media has not shown any Satisfactory Growth in the experiment , Only Activated Sludge shown almost 69 % of growth and the Activated sludge mixed with Poly got almost 70% growth. So, it is clear that the farmers illusion for using Sludge mix poly may damage their plants is not correct. In Practice, STP should sale there Sludge to the farmers with very low prices so that it may be used as a manure for their lands. If the Sludge is not used then it will be dumped into the STP Nearby land as it contains toxic pathogens that enters in to the ground water level with the rain water and polluted the ground water. Sludge mixed with poly has no harm for the plant growth and satisfactory growth found in the experiment and practice should be made by the company and authority to increase the knowledge level

of the farmers and allow them to use the activated sludge for the horticulture.

Spinach Plant in Pot No.1



Spinach Plant in Pot No.2



Spinach Plant in Pot No.3



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