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Rejuvenation of Bio-Fertilizer: An Alternative Source

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ABSTRACT

Indian scenario shows the infertility of chemical fertilizer is increasing day by day as compare to natural or bio-fertilizer so we are facing the symptoms of illness like birth defect, neurological condition like attention deficit, hyperactivity disorder (ADHD), chlorine illnesses like diabetes and degenerative diseases like cancer also, the effect of chemical fertilizer in the farming & agriculture are very high. Farmers were happy of getting increased yield in agriculture in the beginning, but slowly chemical fertilizer started displaying their ill-effect such as: leaching out, polluting water basin, destroying micro-organisms and damaging the plant, hence reduce the crop yield, organic matter from soil leads to soil acidification also excess amount of nitrogen used in chemical fertilizer can cause to the release of greenhouse gases like carbon dioxide and nitrous oxide.

Keywords: bio-fertilizer, cow's dung & urine, compost, insecticide, germinator.

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Rejuvenation of Bio-Fertilizer: An Alternative Source

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ABSTRACT

Indian scenario shows the infertility of chemical fertilizer is increasing day by day as compare to natural or bio-fertilizer so we are facing the symptoms of illness like birth defect, neurological condition like attention, deficit, hyperactivity disorder (ADHD), chlorine illnesses like diabetes and degenerative diseases like cancer also, the effect of chemical fertilizer in the farming & agriculture are very high. Farmers were happy of getting increased yield in agriculture in the beginning, but slowly chemical fertilizer started displaying their ill-effect such as: leaching out, polluting water basin, destroying micro-organisms and damaging the plant, hence reduce the crop yield, organic matter from soil leads to soil acidification also excess amount of nitrogen used in chemical fertilizer can cause to the release of greenhouse gases like carbon dioxide and nitrous oxide.

Bio-fertilizers help to colonize the rhizosphere or the interior of the plant and increasing the growth of the plant by maintaining the availability of micro-organisms. The micro-organisms can regain the soil's natural nutrient cycle and established soil biological matter. Continuous use of bio-fertilizers makes the soil rich in essential nutrients, which promotes good yield. The bio-fertilizer can be needed to reduce the use of synthetic or chemical fertilizer and pesticide. Bio-Fertilizer can be prepared by both ways in solid as well as in liquid form.

This paper is underline In view of the shifting focus towards production methodology, uses as well applications of bio compost, insecticides,

Germinator at homemade and also large scale production. so public awareness programmers to enhance the extra potential of sustainable agriculture development as well as encouraging private organization and policy makers to take interest in this field.

Keywords: bio-fertilizer, cow's dung & urine, compost, insecticide, germinator.

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I. INTRODUCTION

Bio-Fertilizers are defined as preparations containing living cells or latent cells of efficient strains of microorganisms that help crop plants uptake of nutrients by their interactions in the rhizosphere when applied through seed or soil. They accelerate certain microbial processes in the soil which augment the extent of availability of nutrient in a form easily assimilated by plants.

Bio-fertilizers are selective live micro-organism like bacteria, fungi and algae. They provide a cost effective, eco-friendly & renewable source of nutrients. Bio-fertilizers improve the nutrient availability to the crops in which biological process is involved. They play a vital role in improving soil fertility and ensure maintaining long term sustainability.

Use of bio-fertilizer is one of the important component of integrated nutrient management, as they are cost effective and renewable source of plant nutrients to supplement the chemical fertilizers for sustainable agriculture. Several microorganisms and their association with crop plants are being exploited in the production of bio-fertilizer.



Figure 1: Working of Bio-Fertilizer

Bio-fertilizers become popular to counter the negative impact of indiscriminate use of chemical fertilizers. Chemical fertilizers and pesticides have played an important role in boosting the agricultural production for past 50 years in India, since their introduction during green revolution. Their immediate action and low cost resulted in the widespread acceptance and inclusion in cultivation practices. However their long term application contributed in loss of soil fertility along with addition of salts to the soil.

II. METHODOLOGY

Bio-fertilizer is basically divided into three categories such as compost, insecticide and Germinator. The ingredients which are required for making this bio-fertilizer are easily available in the rural area.

2.1 Compost

Table 1: Component of Compost with quantity

Name of Component	Quantity (kg)
1. Cow's Dung	15
2. Cow's Urine	15
3. Wasted Jaggery	1
4. Wasted Dal Flour	1
5. Soil of Pimple or Banyan's Bud	1

Mix all the components in one drum in cold place away from the sunlight and hot places for 15days. Open the drum on 16th day we found it in dried form. Add 200lit water with this compost and spread it over 1Acer land for better illness control.

2.2 Insecticides/Pesticide

Table 2: Compositions of Insecticides

Name of Component	Quantity (kg)
1. Cow's Urine	20
2. Neem's Leaves	2-2 1/2
3. Sitafal's Leaves	2-2 1/2
4. Calotropis Gigantea Leaves	2 1/2 - 3
5. Ipomoea Cornea Leaves	2 1/2 - 3
6. Tobacco's Leaves	1/2 - 1/3
7. Garlic	1/2
8. Chilies	1/2

Take a one drum above a 30lit. Crushed all the Leaves in 20lit urine and add garlic and chilies. Mix the entire component in well manner and boil it about a 30-40°C and cold it. After cooling separate the liquid mixture and scrap. We can use liquid insecticides with 200lit water for 1acer land to better control on insects.

2.3 Germinator (Before Sowing)

Table 3: Compositions of Germinator

Name of Component	Quantity (kg)
1. Cow's Dung	1
2. Cow's Urine	1
3. Lime Powder	1
4. Turmeric	1/4

Mix all above component, add seeds in it and keep in close pot for one night. Dry it in next day and use for sowing.

Apart from this bio-fertilizer if found another symptoms then we can use a following ingredient as a pesticide:

1. Bacterial cancer – Ash of wood or Cow's dung,
2. Leaf spot – 1lit goat milk with 15lit water for 1/3 Acer land,
3. Sawfly larvae - juice of sitafal and Neem,
4. For green leaf – Aloe Vera and cow's urine

III. RESULT AND DISCUSSION

We discuss here about the result of bio-fertilizer on a crop. In the first table we can see an effect of bio-fertilizer and plant growth regulator on growth attributes of fenugreek and second table effect of bio-fertilizer and different sources of organic on wheat crop height (cm) at different growth stages on Mize under field condition.

Crop Height increased with enhancing chemical fertilizer application for non-inoculated seeds.

Table 4: Effect of bio-fertilizer and chemical fertilizer on wheat crop height (cm) at different growth stages on Mize under field condition

Days		15	30	45	60	75	90	105	120 (at harvest)
Wheat Crop Height (cm)	Bio-fertilizer	12.8	21.38	90.33	145.2	147.03	156.98	158.26	162
	Chemical Fertilizer	8.3	15.23	70	146.3	155.03	158	162	170

IV. CONCLUSION

1. Bio-fertilizer (Azotobacter) increases the efficiency of nitrogen fertilizer, increases yield of chili and bring more profit to farmers and also reduce the cost.
2. Higher dose of nitrogen (100kg/ha) of bio-fertilizer produced taller plant, which is an important attribute for higher yield.
3. Higher dose of nitrogen and seeding inoculation of Azotobacter is associated with

higher fruit weight, more number of seeds per fruit and higher dry weight but physiological weight loss is problem.

4. Bio-Fertilizer increases the growth of micro-organisms as well as earthworm which increase nutrient availability, better drainage, and a more stable soil structure. This will happen by the use of bio-compost.

Table 5: Comparison of chemical fertilizer Vs. Bio-fertilizer

Chemical fertilizer Vs. Bio-fertilizer		
Features	Chemical Fertilizer	Bio-fertilizer
Raw material	Non-renewable	Renewable
Energy	Fossil fuel	Solar
Reductant	H ₂	Organic
Catalyst	Al, Fe, Mo oxides	Nitrogenizes enzyme
Temp. & Pressure	750°F, 200-600atmm	Ambient T, P
Energy required	680kj.mol ⁻¹ .NH ₄ ⁺	355kj.mol ⁻¹ .NH ₄ ⁺
Efficiency	40-45%	90%
Pollution Effect	Exists due to indiscriminate use	Pollution free
Cost	High cost input @Rs.6/KgN	Low cost input @Rs.0.20Kg
Soil Health	Deteriorates	Improves

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