

Overview on Low Cost Biofertilizer

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Abstract:

Inorganic fertilizers are much harmful to human being and animals. Therefore, organic fertilizers are good alternative to inorganic or chemical fertilizer as bio-fertilizer. Bio-fertilizers are rich in plant nutrients, which increases the texture and fertility of soil as well as crop yield, quality, nutrients. They are low cost, which increase profitability and the preparation of these fertilizers is not difficult. Therefore, small-scale farmers can easily afford the bio-fertilizer. The cattle keeper farmer can easily manufacture the organic fertilizer from the dung and urine of cow. 'JEEVAMRUT', which is made from the urine and dung of cow, jaggery, pulses flour (especially chickpeas flour), and handful of soil. The dung and urine of cow are excellent manure. 'BEEJAMRUT' is also good organic fertilizer. Plant waste and fruit waste like Neem fruit, Neem leaves, Orange peels, Banana peels, Potato peels, and Onion peels are not only very good but also cost free bio-fertilizer, when it mixed with proper proportion of some ingredients added with these. It is very easily available in food industries and rich in nutrients as well. The other fertilizer, 'PANCHGAVYA', is also organic fertilizer. It is a growth promotor of plants and harmless for flora and fauna. It is alternative organic fertilizer for chemical or inorganic fertilizer.

Keywords: Bio-fertilizer, cow urine, cow dung, manure, orange peel.

Introduction:

Substance that contains living organism are bio-fertilizer [14]. The fertilizers which are manufactured by biological products are called bio-fertilizer. Some Micro-organism are been presented in bio-fertilizer.

Examples: Rhizo-bacteria, Syno-bacteria etc.

In previous year, for increasing the crop yield the farmers were interested in using Chemical fertilizer. Though it (Chemical fertilizer) helped in increasing the crop yield nicely but these are too much harmful for human being as well as cattle.[5] As we compare the cost of chemical fertilizer and organic fertilizer, the cost of chemical fertilizer is more expensive than the cost of organic fertilizer comparatively. The organic fertilizer is low in cost as well as its raw materials are very easier to available. The raw materials like cow urine, cow dung, banana peels, orange peels, onion pills, neem seeds, neem leaves, lemon peels, buttermilk of cow and waste or used flowers etc. Biological fertilizers are useful to increase crop yield. It plays a key role in citrus productivity and sustains soil health. It maintains ecosystem and environmental stability as well. [3,6] No hazardous chemicals are been used in preparation of bio-fertilizer. The expensive infrastructure is not needed for the preparation of bio-fertilizer. Due to all these factors, farmers have tended towards the use of organic fertilizer.

N. Devakumar et. al, 2014 [9] Work organic farming on liquid formulation to examine microbial activity and its uses in high crop production in Jeevamrut and Beejamrut are contains beneficial microorganism in large quantity. The preparation of Beejamrut the microorganism form day of

preparation and Jeevamrut the microorganism are observed after 10th day. This may be due to cow dung, cow urine, jaggery and pulse flour.

It also contains vitamins, essential macro nutrients and micro nutrients, amino acids, indole acetic acid, Gibberlic acid etc. These are growth promoting acids. They concluded liquid organic preparation and contains large number of fungi, N-fixers, P-solubilizer, bacteria from the experiment. It is also concluded that the preparation of Beejamrut are used on the day and the preparation of Jeevamrut are used in 9 to 12 days. The Jeevamrut and Beejamrut are easily prepared and can be produced in low cost as well as the materials are available very easily in villages. Due to its low cost it is very useful for the small scale farmers. The other fertilizer, that is 'Panchagavya' organic fertilizer, is a growth promoters of plants and harmless for human being and animals. It is alternative organic fertilizer to chemical fertilizer. The ingredients are easily available for Cattle keeping farmers. Government also takes a step towards the use of organic fertilizer.

Ahson Javed et.al. 2019[2] Carried a work on agro industrial waste, especially potato peels. Potato peel waste can be collected from different procedure such as: fermentation, and extraction. It can be used as fiber, adsorbent, biofuel, antioxidants as well as food activity. Potato peels are easily available as byproduct of food industries. It is an expensive, valuable and affordable for production of biofuel, fertilizer etc.

Potato peels has been used for synthesis of bio-fertilizer. It contains protein, starch which after degradation in soil gives fertilizer with high nitrogen content.[11]

Bacterial count in potato peels vermin compost is higher than increase surrounding soil fertility. [10]

Potato peels' biogas plant is also useful for bio-fertilizer. It increases nutrient in soil. [8] Similarly potato peel, legume peel, Cow dung, Tulsi leaves, Neem leaves mix together after 45 days for a good bio-fertilizer. They show increase in vegetative growth and physicochemical characteristic of Strawberry fruit. [13] The use of such bio-fertilizer, which are made for agricultural waste. It is economically beneficial for developing countries. The quality of bio-fertilizer made from potato peels is good. The cost of potato peels are negligible because, it is the part of food industries.

Waleed Fouad Abobatta, August 2020[15] Study on productivity of citrus plant by the use of different bio-fertilizer like P-solubilizer, Phosphorus mobilizer, Nitrogen fixer, and Potassium solubilizer boosting the growth of citrus plant. Organic fertilizer plays an important role to control the pest and insects and to protect the citrus plants. Due to organic fertilizer, plants can produce very healthy and chemical free fruits and protect the environment, protect the food chain. Bio-fertilizer plays an important role in plant growth by increasing nutrients like Potassium, Nitrogen, Phosphorus, vitamins and minerals. Bio-fertilizer are useful in fixing atmospheric Nitrogen. The different microorganism play an important role accordingly. Citrus crop is susceptible to iron chlorosis in alkaline condition.[4] The microorganism helps plants by making available the Iron. He found in this work that bio-fertilizer are good alternative to synthetic agrochemicals. Various bio-fertilizers are available to increase citrus plant growth and decrease environmental risk as well as increase nutrients absorption, synthesis of hormones in plants, boost plant resistance to pathogen and improve quality.

Tanmay Chaudhary, September 2020[12] has worked on Panchagavya this is a type of organic fertilizer. It is made up of organic manure. Like Cow dung, cow ghee, cow curd, cow urine and cow milk these all five different byproducts are collected from native or desi cow. Panchagavya is a growth promoter of plant and help to boost the ability to fight against diseases of plants. This organic fertilizer contains macronutrient like Potassium, Phosphorus, Nitrogen and micronutrients like vitamins, amino acids. It is beneficial for microorganism. Panchagavya is made up of these five byproducts of cow with jaggery, Tendered coconut water and ripen Banana. Tendered coconut water and jaggery help to push the process of fermentation and also help to minimize for bad smelling. According to him the bio-fertilizer will be required preparation process under 30 days the pH of bio

fertilizer is low. Because of, the production of certain elements like organic acid. Analysis found out that, it is beneficial to the crops. The plants like mango, maize, guava, turmeric, brinjal, banana, barley and other vegetables, which had taken under consideration by Tanmay Chaudhary.

Panchagavya improves the fertility of soil. It helps to protect the plant or crop and oppose to the disease and insect. The insects are harmful or dangerous to the plants. Organic fertilizer are ecofriendly. Not special method is needed and farmers can create through affordable process. It reduced the cultivation of cost like chemical fertilizers, fungicides, pesticide, insecticides etc.

The action of bio-fertilizer on plant is very slow and therefore it takes much time than other fertilizer. In this period we are required to use the natural fertilizer like Panchagavya. This chemical free organic fertilizer produces chemical free foods and crops. Hence, these play a leading role in organic farming or natural farming. Organic fertilizer needs to make awareness and to grow knowledge among the farmers about its use and utility. Government also taking a step in order to know the benefits of Panchagavya among the next generation of farmers.

Mona I. Nossier, October 2021[7] work to the use of waste such as fruit peels like Banana and Orange peels convert into substitutes of fertilizer. She used ready-made fertilizer on Tomato plant and in second half; she carried field experiment for the same and found 16% to 31% Nitrogen, and 12% to 24% Potassium by use of grounded Banana and Orange peels. After using mineral fertilizer and Banana Orange peel fertilizer the plant growth was nearly same but Potassium concentration was found more in soil with organic fertilizer, and there was no difference in quality of fruits by the use of both fertilizer with Banana and Orange peels. They are rich in nutrients therefore the richness in fruits and vegetables with different nutrients. She concluded that, now a day the trends shift towards reused of organic waste that is plant parts and fruit peels. She recommended to collect fruit waste or peels from food processing units then collected waste are drying and grinding and then added with municipal waste. Add this in to the soil before the plantation of crops or plant. Plant needs very much nutrients. According to need of nutrient of plant one can change quantity of dried orange and banana peels.

Amit Kumar et.al. August 2021[2] Prepared jeevamrut [liquid organic manure] by using cow dung, cow urine, virgin soil, Jaggery, pulses flour and water.

The fertilizer made by fermentation process. In which soil microorganism are present, which are good for plant growth and gives nutrients to plants. The cost of such fertilizer is very low and it is eco-friendly and it is a way to sustainable agriculture. It is an Organic matter. Therefore it is used in organic farming. The microorganism is present in fix nitrogen and rich source of nutrients like Phosphorus, Potassium, Nitrogen.

The time required to prepare Jeevamrut is very small within 2 to 3 days. It can be easily manufactured and used. The pH is 4.93 that is, it is acidic in nature. It contains 1.97% Nitrogen, 0.172% Phosphorus, 0.29% Potassium and 50 PPM of copper. It's application also used to easy 5 to 10% Solution that is 100 to 200 ml per liter. Jeevamrut mix with water and it must be used with 7 to 10 days. It can be stored up to two to three months. It is very good alternative of chemical fertilizer and it is best bioenhancer to improve the quality of soil and crop productivity.

Conclusion:

The procedure of making Organic fertilizer is very easy. All of these bio-fertilizers are chemical free enzyme, biodegradable, rich source of microorganism, micronutrients. They are safe for flora and fauna and they help to decrease the carcinogenic agents. They improve the soil fertility level. It reduces cost of cultivation like pesticide, fungicide, insecticides etc. Organic fertilizer like Panchagavya, Cow urine, cow dung, Jeevamrut, Beejamrut, are low budget fertilizers. They are another income source for agronomist as well as cattle keeper man, at the same time the plant waste

like Orange peels, Banana peels, Lemon peels are form organic fertilizer or enzyme therefore this would also be a side business for food processing industries. Wastage flowers in a huge quantity in Temples and occasion of festivals could be use to make organic fertilizer and could be another income source. Organic fertilizer contains Potassium, Nitrogen and Phosphorous. These are important source of nutrient, which are significant to build up and breathing the plant. Organic fertilizer is ecofriendly for all that is fauna as well as flora. Therefore we say 'that Better environment, Better tomorrow'.

Acknowledgement:

Authors are sincerely thankful to Shri. JTT University, Jhunjhunu, Rajasthan for including to me as research scholar and thankful to respected Vice Chancellor of JTTU, respected Coordinator and Professors of Chemical Sciences. With immense pleasure wish to express our deepest sense of appreciation of my course work guide Teaching and Non-teaching staff. Also express our sincere thanks to respected Dr. Madhu Gupta mam for their valuable suggestion as well as time. And my respected co-guide Dr. M. S. Patil mam (HOD of Chemistry in J. D. M. V. P. S. A. S. C. Nutan Maratha College, Jalgaon) for their continuous valuable time, guidance, support and encouragement. Also thank you to my friend (Ph.D. Research Scholars) for helping me during the period of course work classes.

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