IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

ORGANIC FERTILIZER: NEED OF INDIA

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Abstract:
Organic fertilizers are naturally available mineral sources that contain moderate amount of plant essential nutrients. They are capable of mitigating problems associated with synthetic fertilizers. They reduce the necessity of repeated application of synthetic fertilizers to maintain soil fertility. They gradually release nutrients into the soil solution and maintain nutrient balance for healthy growth of crop plants. They also act as an effective energy source of soil microbes which in turn improve soil structure and crop growth. Organic fertilizers are generally thought to be slow releasing fertilizers and they contain many trace elements. They are safer alternatives to chemical fertilizers. However, the improper use of organic fertilizers leads to overfertilization or nutrient deficiency in the soil. Hence, controlled release of organic fertilizers is an effective and advanced way to overcome these impacts and maintain sustainable agriculture yield.[a]

Keywords: Organic fertilizer, Save soli, organic farming, organic products, healthy produce, rural agriculture, smart agriculture.

Introduction:

Organic fertilizer refers to those organic amendments applied to soils, other than direct deposition of excreta by grazing animals, and includes animal manure, sewage sludge and compost, along with rendering waste, guano, brewery waste, digestate and other bio-wastes. Organic fertilizer inputs in agricultural fields in the present scenario has significant environmental benefits over the use of chemical fertilizers and the practice has
gained much importance. Food waste fermentation process plays the preliminary but indispensable role in the whole organic fertilizer production process. Composting can convert food waste into hygienic, humus-rich, relatively stable product that conditions soils and nourishes plants.[1]

Organic farming, also known as ecological farming or biological farming,[2] is an agricultural system that uses fertilizers of organic origin such as compost manure, green manure, and bone meal and places emphasis on techniques such as crop rotation and companion planting. It originated early in the 20th century in reaction to rapidly changing farming practices. Certified organic agriculture accounts for 70 million hectares (170 million acres) globally, with over half of that total in Australia.[3] Biological pest

control, mixed cropping, and the fostering of insect predators are encouraged. Organic standards are designed to allow the use of naturally-occurring substances while prohibiting or strictly limiting synthetic substances.[4] For instance, naturally-occurring pesticides such as pyrethrin are permitted, while synthetic fertilizers and pesticides are generally prohibited. Synthetic substances that are allowed include, for example, copper sulfate, elemental sulfur, and veterinary drugs. Genetically modified organisms, nanomaterials, human sewage sludge, plant growth regulators, hormones, and antibiotic use in livestock husbandry are prohibited.[5] Organic farming advocates claim advantages in sustainability,[6] openness, self-sufficiency, autonomy and independence,[7] health, food security, and food safety.

Organic agricultural methods are internationally regulated and legally enforced by transnational organizations (as European Union) and many nations, based in large part on the standards set by the International Federation of Organic Agriculture Movements (IFOAM), an international umbrella organization for organic farming organizations established in 1972.[8] Organic agriculture can be defined as "an integrated farming system that strives for sustainability, the enhancement of soil fertility and biological diversity while, with rare exceptions, prohibiting synthetic pesticides, antibiotics, synthetic fertilizers, genetically modified organisms, and growth hormones".[9]

Since 1990, the market for organic food and other products has grown rapidly, reaching $63 billion worldwide in 2012.[10]:25 This demand has driven a similar increase in organically managed farmland that grew from 2001 to 2011 at a compounding rate of 8.9% per year.[11]

As of 2022, approximately 96,000,000 hectares (240,000,000 acres) worldwide were farmed organically, representing approximately 2% of total world farmland.[12]

Organic farming can be beneficial on biodiversity and environmental protection at local level. However, because organic farming has sometimes lower yields compared to intensive farming, additional agricultural land is needed elsewhere in the world, which means that natural and forest land has to be converted into agricultural land. This can cause loss of biodiversity and negative climate effects that sometimes outweigh the local environmental gains achieved. This lower yields does not include dry lands.[13] Food waste of industrial agriculture must be taken into account.

Comparison of organic fertilizer & other:

Parameters	Chemical Fertilizer	Organic fertilizer
Price	Rupees 80 per kg	Rupees 60 per kg [13]
Water usage	When chemical fertilizers are used in agriculture then the sand needs more water for agricultural purpose. For Instance, the land is to be irrigated for almost 4 to 5 times in a year.	When Organic Fertilizers are used in agriculture then the sand needs not more water or less water than chemical fertilizers for agricultural purpose, For instance, the land is to be irrigated only 2 times in a year.
Eco friendliness	Chemical Fertilizers are nor more environmental friendly.	Organic Fertilizers are eco friendly in nature.
Positive and negative points	Chemical Fertilizers are harmful not only for humans but also for animals and plants. The only benefit is that chemical fertilizers show quicker results.	Organic fertilizers are neither harmful for humans nor for animals and plants. The only thing is that it takes time to give result.
Benefit to soil	Chemical fertilizer decreases the soil pH level. [14]	As organic fertilizer break down they improve the structure of the soil and increase its ability to hold water and nutrient. [15]
Soil Microfauna	It results in killing of soil microfauna	Causes and increases soil microfauna.[16]
Nature	This are non-biodegradable in nature and are not ecofriendly. [18]	Organic fertilizers are renewable, biodegradable, sustainable and environmental friendly in nature. [17]

Methodology

Organic Fertilizers are eco-friendly in nature. Continuous use of chemical fertilizers has brought about a great change in the structure and texture of the soil. Due to this change, the soil has become moisture-free and hard. Use of organic fertilizers becomes essential for moisture conservation in rainfed areas. By using this, agricultural production can be increased by supplying nutrients at cheap rates to the cultivable land as per the requirement. Organic fertilizer is easy and cheap to prepare, and compared to chemical fertilizers, its use does not cause any harm to the crop and soil. Use of organic fertilizers not only fulfills the essential nutrients of the soil but also increases its physical and biological properties. Therefore, it is necessary that to get more agricultural production, along with soil testing, the use of organic fertilizers should be promoted instead of chemical fertilizers as per the requirement of the crops. The process for making organic fertilizer:

- Collected the vegetable waste, cow dung and sand.
- Firstly, Cow dung layer of 1 fist was kept in a pot.

- Vegetable layer of 1 fist was added on the cow layer.
- Sand layer of 1 fist was added on vegetable layer.
- Again, Vegetable layer of 1 fist was added
- Cow dung layer of 1 fist was added
- Finally, it was kept close for 2 weeks

After two weeks finally the fertilizer is ready to use.

Figure A: cow dung

figure B: vegetable waste

Comparison using Experimentation :

Figure C: organic fertilizer

Experiment done on brinjal plant using organic fertilizer

Figure A: Brinjal plant before using organic fertilizer

Figure B: Brinjal plant after using organic fertilizer

Result Analysis of Brinjal plant :

The Brinjal plant showed good growth in 2 weeks after using organic fertilizer in a dried Brinjal plant. As seen in the figure the brinjal plant has not only turned out green but also has bloomed one flower and similarly few brinjals will also be seen on the plant. This process has taken place without using any chemical and hence it is environmental friendly and healthy.

Conclusion:

The use of organic fertilizers plays a significant role in sustainable agriculture and for improving soil health. They are easily available at low cost and also very easy to apply in fields. The crop yield increases by 10–25% by increasing organic fertilizers. They are of the main prerequisites of organic farm management. Application of organic fertilizers has proven beneficial for effective production of crops. [19] Organic fertilizer also helps maintain soil structure, makes the soil more resistant to erosion, and helps with water infiltration. In these ways, organic fertilizers can help keep nutrient and water cycling balanced in the ecosystem. Since chemical fertilizers have a negative impact on soil fertility, biofertilizers have been developed. These are substances that include microorganisms, latent cells, or both. They give the soil the nutrients and microorganisms the plants need to develop.

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