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A Review On Biomanure From Biomass As A Biogas Substrate

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Abstract
The Study Aimed To Investigate The Enhancement Of Biogas Production Through Anaerobic Digestion From Blends Of Wastewater And Microalgae. The Microalgae Functioned As A Co-Substrate. A Series Of Laboratory-Scale Batch Anaerobic Co-Digestion Of The Wastewater And Microalgae Were Carried Out Under Mesophilic Conditions For 21 Days. Biogas Production Rates From Wastewater (WW) Alone And Different Blends Of WW And Microalgae (MA) Were Analysed. In Addition, The Nutrient Values And Reduction In The Volume Of The WW After Digestion Were Determined. Subsequently, Different Conversion Technologies (I.E., Thermo-Chemical, Biochemical, And Physico-Chemical Conversions) And Their Corresponding Products Are Reviewed And Discussed. In The Continuation, The Global Status Of Biomass Vs. *The Other Renewable Energies Is Scrutinized. Moreover, Biomass-Derived Energy Production Was Analyzed From Economic And Environmental Perspectives.*

Key Words: *Bio Energy, Biomass, Bio Manure, Cyanobacteria, Nutrient Enrichment*

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I. Introduction

Manure is an organic matter derived from the solid animal wastes, used to improve the soil quality and increase the yield of healthy crops. Manure is the decomposed form of dead plants and animals, which is applied to the soil to increase production. It is a natural form of fertilizer and is cost-effective. The human and animal excreta is also used as manure. The livestock manure is rich in nitrogen, phosphorus, and potassium. Manure is highly rich in organic matter and humus and thus improves the soil fertility. These are better in the long run and does not cause any pollution. It is a valuable and renewable resource. Manure can be obtained from various sources.

The different sources of manure are mentioned below:

- Cattle dung, urine, and slurry from biogas plants.
- Wastes from human habitation such as human urine, night soil, sludge, sewage, domestic waste.
- Droppings of goat and sheep.
- Waste from the slaughterhouses such as bones, meat, horn and hoof meal, fish waste.
- By-products of agricultural industries.
- Crop waste.
- Weeds, water hyacinth.

production have adverse effect on soil health and production. Organic material such as animal manure, crop residue, farm yard manure (FYM), green manure, urban organic waste, biog as spen t slurr y, vermico mpost and Chemical fertilizers applied injudiciously to boost food production have adverse effect on soil health and production. Organic material such as animal manure, crop residue, farm yard manure (FYM), green manure, urban organic waste, biogas spent slurry, vermi compost and microbial formulations have been applied to restore the soil fertility. The organic matter of the soil is a major deciding factor for improving crop yield. It undergoes mineralization process and get converted into carbon dioxide, water, nitrogen, phosphorous, sulphur and some micronutrients. Organic matter is applied to the soil either naturally by decomposition of sloughed-off roots and stubbles by microbial activity or through bio manure application. Regular recycling of organic waste into the soil is an efficient method for maintaining the optimum level of organic matter in the soil. Organic manures have been proven to enhance the crop yield, improve the fertility and water holding capacity of the soil, and reduce the need for chemical fertilizers. Depending on the nitrogen content, organic manures are categorized into bulky and concentrated organic manures. The organic manure

treatment induces changes in the soil properties such as organic carbon, porosity, bulk density etc. that enhances the crop yield.

II. Materials and Methods

Chemical fertilizers applied injudiciously to boost food production have adverse effect on soil health and production. Organic material such as animal manure, crop residue, farm yard manure (FYM), green manure, urban organic waste, biog as spen t slurr y, vermico mpost and Depending on the nitrogen content, organic manures are categorized into bulky and concentrated organic manures. No biogas programme can be improved without regular evaluation. And no evaluation is possible without a proper survey. With a biogas programme ecological stability could be achieved by satisfying two criteria, namely burning biogas instead of firewood, and not using cattle cake and other agricultural waste directly as fuel, but using it in biogas plants to produce both fuel and fertilizer. We have to be aware of the fact that biogas plays a fairly minor role in a country's overall ecological and economic planning. The methodology of evaluation must take the lack of funds into consideration. It is pointless to describe an ideal method of surveying and evaluation if the ideal survey will never be financed. Therefore, we need only look for a method that is feasible. Composting is the biological decomposition of ligno-celluloid organic material into a simple compound, a humus-like end-product called "compost". It is a rich source of organic manure. It helps improve the quality of soil. It's an aerobic process which uses various micro-organisms such as bacteria, action mycetes and fungi to break down the higher organic compounds like cellulose and lignin into simpler substances. During composting, the micro-organisms consume oxygen while feeding on organic matter, and multiply. Active composting generates a considerable amount of heat. It also discharges large quantities of carbon dioxide and water vapor into the atmosphere. The loss of carbon-dioxide and water vapor reduces the weight of the initial dry organic matter. Thus composting reduces both the volume and the mass of the organic matter. Press mud is stored in triangular shaped rows known as windrows. Spent wash is sprayed on each windrow at specific intervals. The windrows are then turned. This helps in homogenizing the entire mass, maintaining uniform temperature and moisture with effective aeration and oxygen supply. During the composting process, the temperature goes up to 650-700 C. Due to the churning of the mixture of press mud and spent wash by aero tillers, oxygen is supplied to bacteria, thereby accelerating the composting process. It also dissipates the excess heat generated. Bacteria separate carbon and other complex compounds from press mud and spent wash. Enhancing the effectiveness of this process requires 50-60% moisture.

Green Manure Crops	**Seed Rate (Kg/ha)**
Sunnhemp	40
Dhainncha	30
Guar	20
Cowpea	50
Green gram/Black gram	20-25

III. Result & Discussion

Organic manure is a natural source of nitrogen (N) formation process in the soil. Livestock manure returns essential macro elements including N (2.42%), P (1.51%), and K (0.41%), as well as micronutrients such as magnesium, calcium, sulphur, and manganese to the soil while maintaining its fertility. Theoretically, incorporating organic manure in soil should improve the growth attributes of plants. However, in this study we demonstrate that an optimum amount of organic manure is advantageous for higher yields. Furthermore, elevated temperatures substantially improved chilli pepper fruit yield in the greenhouse and rain-shelter house conditions. Likewise, plant growth parameters such as the dry weight of leaf, shoot, and root tended to be higher in the greenhouse followed by rain-shelter plastic house compared to the field conditions. Favorable elevated temperature conditions were the reason for the intensive plant growth in the greenhouse, although several authors have declared the negative impact of elevated temperatures on crop productivity. Similarly, air and soil temperatures were higher under greenhouse followed by rain-shelter plastic conditions than those in the field condition. Organic manure application improves soil physical–chemical properties by actively facilitating bacterial growth as well. Rational implementation of organic manure is accompanied by the highest productivity of agricultural crops and without environmental damage even under adverse climatic conditions.

IV. Conclusion

Biofertilizer have got an important role in increasing the crop production. They improve the soil health status and provide different growth promoting hormones and phytohormones to the plant. They do not leave the residual effects like that of the chemical fertilizers. Hence the use of Biofertilizer could be the proper

option for sustainable agriculture. The use of bio-fertilizers is essential for soil health. When compared to chemical fertilizers it is better to use bio-fertilizers. Bio-fertilizers makes sure nutrients are up taken by the plants. Some nutrients that are limited for plants are made available by the bio-fertilizers. Nitrogen is limited in most soils but with biofertilizers it is made available through nitrogen fixing microorganism.

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