



Effects of liquid Fermented Organic Manure (LFOM) on Crop Productivity and Soil Health

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INTRODUCTION

Agriculture is the backbone of food security, but conventional farming practices have adversely affected soil quality and environmental health. Continuous application of chemical fertilizers has led to nutrient imbalance, soil compaction, and loss of beneficial microorganisms. Liquid fermented organic manure, prepared from animal dung, crop residues, and microbial inoculants through controlled fermentation, provides a biologically active nutrient source that improves both crop performance and soil structure. This approach aligns with sustainable and organic farming principles. Organic farming is based on a system-oriented approach and the use of liquid fermented organic manure such as Jeevamrut, beejamrut, cow urine has resulted in increased crop growth, yield and quality, as well as increased interest in the use of liquid formulations. Liquid organic manures containing a range of beneficial microorganisms may trigger biological processes in the soil to restore fertility, as well as function as plant growth stimulants to improve yield and quality. At the present time increase in the cost of inorganic fertilizer and other inorganic inputs has a negative impact on the socioeconomic conditions of Indian farmers. Adverse effect of agricultural technologies adopted during green revolution on loss of long-term soil fertility, soil erosion, diminishing water resources, soil and water pollution, salinized ground water, higher incidences of human, plant and animal diseases and increased global warming.

Types of liquid fermented organic manure

1. Jeevamrut

- Prepared from cow dung, cow urine, jaggery, pulse flour, and soil.
- Rich in beneficial microbes.
- Used for seed treatment, soil drenching, and foliar spray.

2. Panchagavya

- Made from five cow products: cow dung, cow urine, milk, curd, and ghee (plus jaggery and banana).
- Acts as a growth promoter and immunity booster for crops.

3. Beejamrit

- Mainly used for seed treatment.
- Protects seeds from soil-borne pathogens.
- Improves germination and early seedling growth.

4. Fish amino acid (FAA)

- Prepared by fermenting fish waste with jaggery.
- Rich in amino acids and nitrogen.
- Useful for vegetative growth of plants.

5. Fermented plant extract (FPE)

- Made from fermented green plants, weeds, or leaves.
- Provides micronutrients and growth hormones.

6. Vermiwash

- Liquid obtained from vermicompost units.
- Contains enzymes, hormones, and beneficial microbes.
- Improves soil fertility and plant growth.

7. Cow urine-based fermented manure

- Prepared by fermenting cow urine with herbs and jaggery.
- Acts as bio-pesticide and nutrient source.

Impact of liquid fermented organic manure on crop productivity

1. Enhanced nutrient uptake

LFOM contains readily available macro and micronutrients that plants can absorb efficiently. Unlike synthetic fertilizers, nutrients in fermented manure are released gradually, ensuring steady supply throughout the crop growth cycle. This results in improved plant vigor and higher yields.

2. Improved plant growth and root development

Application of LFOM stimulates root elongation and branching, allowing plants to access deeper soil moisture and nutrients. Stronger root systems contribute to better overall plant health and resilience against environmental stress.

3. Increased photosynthetic efficiency

Studies indicate that crops treated with liquid organic manure exhibit higher chlorophyll content, leading to better photosynthesis and biomass accumulation. This ultimately enhances grain, fruit or fodder yield.

4. Reduced dependency on chemical fertilizers

Regular use of LFOM minimizes the need for synthetic fertilizers, reducing production costs for farmers while maintaining or even increasing crop productivity.

Impact of liquid fermented organic manure on soil health

1. Improvement in soil structure

LFOM enhances soil aggregation, which improves porosity, aeration, and water retention capacity. This is particularly beneficial for sandy or degraded soils.

2. Stimulation of soil microbial activity

Fermented manure introduces beneficial microorganisms such as bacteria, fungi and actinomycetes into the soil. These microbes play a crucial role in decomposing organic matter and cycling nutrients.

3. Increase in soil organic carbon

Continuous application of LFOM builds soil organic matter, which improves fertility, nutrient retention, and long-term soil resilience.

4. Regulation of soil pH

LFOM helps maintain balanced soil pH by buffering extreme acidity or alkalinity, making nutrients more available to plants.

5. Reduction in nutrient leaching and erosion

Better soil structure reduces runoff and nutrient loss, preventing groundwater contamination and preserving soil fertility.

Environmental and Economic Benefits

- Reduces chemical pollution in water bodies
- Lowers greenhouse gas emissions associated with synthetic fertilizers

- Supports biodiversity in agricultural ecosystems
- Cuts input costs for small and marginal farmers
- Promotes sustainable and organic farming systems

REFERENCES

- Peralta, A. L., Sun, Y., McDaniel, M. D. & Lennon, J. T. Crop rotational diversity increases disease suppressive capacity of soil microbiomes. *Ecosphere* 9, e02235 (2018).
- Han, S. H., An, J. Y., Hwang, J., Kim, S. B. & Park, B. B. The effects of organic manure and chemical fertilizer on the growth and nutrient concentrations of yellow Poplar (*Liriodendron tulipifera* Lin.) in a nursery system. *Sci. Technol.* 12, 137–143 (2016).
- Kurt, D. & Ayan, A. K. Effect of the different organic fertilizer sources and doses on yield in organic tobacco (*Nicotiana tabacum* L.) production. *J. Agric. Fac. Gaziosmanpasa Univ.* 31 (2014).
- Zhang, L., Meng, T., Zhang, Z. & Mu, Y. Effects of organic fertilizer substitution on the technical efficiency among farmers: evidence from Bohai rim region in China. *Agronomy* 13, 761 (2023).
- Halder, J. N., Lee, M. G., Kim, S. R. & Hwang, O. Utilization of thermophilic aerobic oxidation and electrocoagulation to improve fertilizer quality from mixed manure influent. *Agronomy* 12, 1417 (2022).