



## Fermented Organic Manures: A Low-Cost Solution for Soil Fertility Improvement

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Declining soil fertility, rising input costs, and environmental degradation due to excessive use of chemical fertilizers have become major challenges in modern agriculture. Fermented organic manures (FOMs) offer a sustainable and low-cost solution for improving soil health and crop productivity. These manures are prepared through the biological fermentation of locally available materials such as cow dung, cow urine, jaggery, crop residues, and pulse flour, which enhance microbial activity and nutrient availability in the soil. Common fermented formulations include Jeevamrit, Ghanjeevamrit, Panchgavya, and fermented farmyard manure. Their application improves soil microbial activity, nutrient mineralization, soil structure, water-holding capacity, and soil organic carbon content. In addition, fermented organic manures reduce dependence on chemical fertilizers, lower production costs, and promote environmentally sustainable farming systems. Despite certain challenges such as lack of standardization and limited farmer awareness, fermented organic manures have significant potential for enhancing soil fertility and supporting sustainable agriculture.

**Keywords:** Jeevamrit, Microbial activity, Panchgavya, Soil health, Sustainable agriculture.

### Introduction

In recent years, Indian agriculture has been facing serious challenges such as declining soil fertility, rising input costs, and environmental degradation due to excessive dependence on chemical fertilizers. Continuous use of synthetic inputs has adversely affected soil biological activity, organic carbon content, and nutrient use efficiency. Under such circumstances, fermented organic manures (FOMs) have emerged as an effective, low-cost, and eco-friendly alternative for improving soil fertility and sustaining crop productivity. Fermented organic manures are prepared using locally available organic resources through biological fermentation processes that enhance nutrient availability and microbial activity. These manures play a vital role in restoring soil health while reducing farmers' dependency on costly external inputs.

### What are Fermented Organic Manures?

Fermented organic manures are biologically activated organic inputs produced by fermenting organic materials such as cow dung, cow urine, crop residues, oil cakes, jaggery, and pulse flour with the help of beneficial microorganisms.

The fermentation process increases the population of beneficial microbes and converts nutrients into plant-available forms. Common examples of fermented organic manures used in Indian agriculture include:

- Jeevamrit
- Ghanjeevamrit
- Panchgavya

- Fermented Farmyard Manure (FYM)
- Liquid organic formulations

## Types of Fermented Organic Manures

### 1. Jeevamrit

Jeevamrit is a liquid fermented organic manure prepared using cow dung, cow urine, jaggery, pulse flour, soil, and water. It acts as a microbial culture rather than a direct nutrient source.

#### Benefits:

- Enhances microbial population in soil
- Improves nutrient mineralization
- Boosts root growth and crop vigor

### 2. Ghanjeevamrit

Ghanjeevamrit is the solid form of jeevamrit, prepared by drying the fermented mixture. It is easier to store and apply.

#### Benefits:

- Improves soil organic carbon
- Enhances soil structure
- Suitable for basal application

### 3. Panchgavya

Panchgavya is prepared by fermenting five cow-based products—milk, curd, ghee, dung, and urine along with other natural ingredients.

#### Benefits:

- Acts as a plant growth promoter
- Enhances flowering and yield
- Improves crop resistance to pests and diseases

## Role Of Fermented Organic Manures In Soil Fertility Improvement

### 1. Enhancement of Soil Microbial Activity

Fermented organic manures supply a rich consortium of beneficial microorganisms such as bacteria, fungi, and actinomycetes. These microbes play a key role in nutrient cycling and organic matter decomposition.

### 2. Improved Nutrient Availability

Fermentation converts complex organic nutrients into simpler, plant-available forms. It enhances the availability of major nutrients like nitrogen, phosphorus, and potassium, as well as micronutrients.

### 3. Improvement in Soil Physical Properties

Regular application of fermented organic manures improves soil aggregation, porosity, and water-holding capacity, which ultimately enhances root growth and crop productivity.

### 4. Increased Soil Organic Carbon

Fermented manures contribute to the buildup of soil organic carbon, which is crucial for long-term soil fertility and sustainability.

## Economic And Environmental Benefits

- **Low Cost:** Prepared from on-farm resources, reducing dependence on costly fertilizers
- **Eco-friendly:** Free from harmful chemicals and safe for soil, water, and environment
- **Sustainable:** Improves soil health and productivity in the long run
- **Climate Resilient:** Enhances carbon sequestration and reduces greenhouse gas emissions

## Role In Sustainable and Natural Farming Systems

Fermented organic manures form the backbone of natural and organic farming systems. They align well with the principles of sustainable agriculture by promoting biological soil health, reducing chemical inputs, and improving farm profitability.

Government initiatives such as the National Mission on Natural Farming (NMNF) and Bharatiya Prakritik Krishi Paddhati (BPKP) emphasize the use of fermented organic inputs for enhancing soil fertility and farmer income.

## Challenges in Adoption

Despite their benefits, the adoption of fermented organic manures faces some challenges:

- Lack of standardized preparation methods
- Limited awareness among farmers
- Initial labour requirement
- Variability in nutrient content

Addressing these challenges through training, demonstrations, and scientific validation is essential for large-scale adoption.

## Conclusion

Fermented organic manures offer a low-cost, sustainable, and farmer-friendly solution to restore soil fertility and enhance crop productivity. By improving soil biological activity, nutrient availability, and organic carbon content, these inputs contribute significantly to sustainable agricultural systems. Integration of fermented organic manures with recommended agronomic practices can play a crucial role in achieving long-term soil health, environmental sustainability, and improved farmer livelihoods.