

Liquid Organic's:- A Potential Source of Nutrient's in Organic Agriculture

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ARTICLE ID: 070

Introduction

Agriculture met the challenge of feeding the world's poor by the green revolution with the help of high yielding varieties and high fertilizer application. The indiscriminate use of agro-chemicals has adversely affected the soil fertility and the quality of agricultural products, which eventually lead to high demand for organic products by the society. Organic agriculture is a production system that sustains health of soil, ecosystem and people, by relying on ecological process, bio diversity and natural cycles and adapted to local conditions than use of inputs with adverse effects (International Federation for Promotion of Organic Agricultural Movement - IFOAM). In general, organic farming is more desirable for its long-term objective of improving soil fertility there by helping the sustained production. In organic production systems, there is always a challenge to improve soil fertility and crop productivity using organic techniques. Use of organic liquid preparations has been an age-old practice in India. The liquid organic manures are potential source of manure to improve the physical, chemical and biological properties of soil that leads to enhance the soil fertility, crop productivity.

What are Liquid Organic Manures?

Liquid organic manures are obtained by active fermentation of animal products like cow dung, urine and plant residues over specific duration. On an average, preparation of liquid manure takes 2-3 weeks. The liquid organic solutions contain macro nutrients, essential micro nutrients, many vitamins, essential amino acids, growth promoting hormones like Indole Acetic Acid, gibberellic acid and beneficial microorganisms. Liquid organic manures quickly decompose the organic wastes, improve humus content of the soil which is essential to maintain the activity of microorganisms and other soil biota.

Need of the Day?

- Substantial losses from pests, diseases and weeds persist, despite billions of lbs. of pesticides are used annually.
- Sustainability in agriculture is one of the major concerns of humanity as on today.
- To find farming systems which works in harmony with nature rather against it.

Different Liquid Organic Manures, Composition and their Nutrient Content:

Jeevamrut:

Mix 10 kg's of desi cow dung, 10 liters of desi cow urine, 2 kg's of jaggary, 2 kg's of pulse flour and hand full of soil in 200 liters of water and ferment it for 10 days. It can be applied on soil by diluting it with irrigation water @ 500 lit ha⁻¹. Average nutrient content of jeevamrutha is nitrogen 1.48%, phosphorus 0.28% and potassium 0.32%.

Amritpani:

10 kg's of desi cow dung is mixed with 500 gms of honey and 250 gms of desi cow ghee which is mixed in 200 liters of water. The formulation is fermented for 7 days and can be used for drenching. Average nutrient content of amritpani is 1.68% nitrogen, 0.33% phosphorus and 0.24% potassium.

Sanjivak:

100 kg's of desi cow dung, 100 liters of desi cow urine, 500 gm's of jaggary are mixed with 300 liters of water and fermented for 10 days the formulation is used for soil application. Sanjivak has nitrogen, phosphorus and potassium content of 1.48%, 0.28%, 0.32%, respectively.

Panchagavya:

Panchagavya (a combination of desi cow urine, milk, dung, ghee and curd). In Sanskrit, all these five products are individually called "Gavya" and collectively termed as "Panchagavya". Desi cow dung of 7 kg's, 1 kg desi cow ghee are mixed and fermented for 2 days. On 3rd day 2 liters of desi cow urine, 10 liters of water are added and incubated for 10 days. After ten days 2 liters of desi cow milk, 2 liters of desi cow curd, 250 gm's of jaggary, tender coconut water of 2 liters and 12 ripened cavendish bananas are added and allowed to ferment for 15 days. The liquid formulation is used as foliar spray @3 % or @5%. Average nutrient content is 0.06%, 0.03% and 0.04% of nitrogen, phosphorus and potassium respectively.

Bio digested liquid manure (BDLM):



Fresh leaves and tender branches of any green manure plant of 30 kg's, desi cow dung 15 kg's, desi cow urine 20 liters and 100 liters of water are added in a cement tank and fermented for 45 days. The formulation is used for soil application. The average nutrient content is 1.06% nitrogen, 0.23% phosphorus and 0.35% potassium.

Dashgavya:

5 kg's of desi cow dung and 1 liter of desi cow ghee are mixed and fermented for three days. On fourth day desi cow urine of 3 liters, 2 liters of desi cow milk, 2 liters of desi cow curd, 3 liters of sugarcane juice and coconut water, 12 ripened banana paste, 2 liters of grape juice are added and fermented for 18 days. It can be used as foliar spray, seed treatment or soil application @ 50 lit ha⁻¹. Nitrogen, phosphorus and potassium content are 0.086%, 0.013% and 0.118%, respectively.

Vermiwash:

A plastic barrel is filled with brick pieces, coarse sand and fine soil along with cow dung and soaked straw layer wise. 100 earthworms are left on fine soil layer. Place a plastic basin of 2.5 litre capacity with small pores above barrel and fill water regularly. The added water passes through the organic matter and washes the body of earthworm the filtrate collected at the bottom of barrel is called as vermiwash. Vermiwash has nutrient content of 0.02% nitrogen, 0.010% phosphorus and 0.2% potassium.

Beejamrut:

5 kg's of desi cow dung is kept in a cloth bag and suspended in a container of water, after 15-16 hrs it is squeezed to collect the extractant. 5 liters of desi cow urine, 50 gm's of virgin forest soil, 1 liter of lime water, 20 liters of water are added to the extractant. The liquid is fermented for 8 -12 hrs and used for seed treatment.

Liquid Cow urine:

Cow urine can be used as a foliar spray or applied to the soil. Nitrogen, phosphorus and potassium are the three major nutrients required for healthy plant growth. Cow urine contains significant amounts of both nitrogen and potassium.

- ✓ Research shows that only 20 % of nitrogenous materials consumed by cattle is absorbed and 80 % is excreted in urine and dung.
- ✓ 52 % of Nitrogen returns in the form of urine while 28 % return in form of dung.
- ✓ 61-87 % phosphorus and 82-92 % potash were also obtained from cow urine.



- ✓ In 24 hours, a cow can give 6 litres of urine. If a farmer can have 2 cows in her/ his farms it gives 4380 litres of urine in one year, which equals 65 kg nitrogen, that amount of nitrogen equals to 136 kg urea.

Liquid Biofertilizers:

Nitrogen, phosphorous and potassium are the three major plant nutrients. The fertilizers production in our country is less than the required amount. To fill this gap, alternate sources of nutrients have to be looked for. Organic wastes and biofertilizers are the alternate sources to meet the nutrient requirement of crops and to bridge the further gaps. Further, knowing the harmful effect of using only chemical fertilizers on soil health, supplemented use of biofertilizers along with chemical fertilizers can manage the ecosystem. Such integrated approach will help to maintain soil health and productivity.

Biofertilizers are preparations containing living cells or latent cells of efficient strains of microorganisms which are capable of fixing atmospheric nitrogen, solubilizing and enhancing uptake of soil phosphorus, stimulating plant growth through synthesis of growth promoting substances and also helps to improve soil health in general. Totally harmless, pollution free and low-cost renewable agricultural inputs.

Benefits of Liquid Organic Manures:

1. Liquid organic manures balance the soil eco system and boost the soil health by increasing the soil organic matter content.
2. The nutrients are delivered in slow and sustainable rate and prevents over nutrition.
3. Liquid organic manures helps in increase of uptake of macro and micro nutrients compared to mineral fertilizers due to improved soil microbial activity.
4. Organic liquid fertilizers support growth of nitrogen fixing bacteria to fix sufficient atmospheric N to supply the need of growing plants.
5. Salt content in soil is reduced by application of liquid organic manures.

Disadvantages:

1. Liquid organic manures takes longer time in supplying nutrients as they are slow releasing at initial stages of crop growth.
2. These manures have relatively lesser amount of micro nutrients than macro nutrients.

Conclusion:

The increasing concern for environmental safety, food security and global demand for pesticide residue free food has evoked keen interest in crop production using eco-friendly products which are easily biodegradable and do not leave any harmful toxic residues besides conserving nature. So, it is necessary to use natural products like different Liquid Organics to produce chemical residue free foods. Liquid organic manures are efficient and economical choice for the farming community as most of the inputs used for preparation are available in the field. Use of liquid organics panchagavya, jeevamrut and beejamrut proved beneficial effect in different crops and produced better growth of plants and crop productivity to increase sustainable production. All the liquid organics inputs hold good promise for use in agriculture and production of safe and healthy food.

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