Fertilizing Naturally: Embrace Organic Liquid Manures

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Abstract

Liquid organic manures emerge as a boon for farmers, countering the prevalent reliance on chemical fertilizers in modernized Indian agriculture. Despite the longstanding tradition of using organic liquids in crops, contemporary practices favour tripled quantities of chemical solid or liquid fertilizers, disregarding associated health risks. The rapid environmental degradation and health hazards necessitate a return to liquid organic manures, a practice deeply rooted in India's agricultural history. Revitalizing this tradition becomes crucial for preserving both human health and the environment. Liquid organic manures serve as a potent solution, enhancing soil physical, chemical, and biological properties to boost soil fertility and elevate crop productivity, offering a sustainable alternative to conventional farming practices.

Introduction

In the wake of urbanization and industrialization the surge in population has emerged as a pressing concern for both the environmentalists as well as the government. To meet the needs of this burgeoning population adoption of intensive chemical farming is being embraced rapidly in order to amplify the crop yield posing threats to our soil, water, plants, health, biodiversity and above all, environment. In the current context of growing demand for chemical-free goods, there exists a significant opportunity for organic crop production both within India and internationally. In the framework of organic farming practices, along with adopting enhanced agronomic methods and applying various composts, the role of liquid manures like Compost tea, Vermiwash, Himsol, Himslurry, Matkakhad becomes exceptionally crucial as these substances play a pivotal role in upholding the microbial activity and also act as good growth prompters when used in given along with drip irrigation or used as foliar sprays. The easy solubility of liquid organic manures in water allows for efficient absorption by plants, in contrast to the slower and less effective absorption of nutrients from bulky organic manures. The effective absorption of nutrients by plants can be impeded by the use of bulky organic manures. Liquid manures offer a solution to this issue, acting as a protective measure to alleviate temporary and acute nutrient shortages in crops. Here are a few examples of organic liquid manures, each with its own composition. These formulations play a crucial role in promoting crop growth by enhancing various physiological and biochemical processes within plants. By increasing nutrient availability and aiding in the tolerance of both biotic and abiotic stresses, these organic liquid manures contribute significantly to overall plant health and productivity.

Organic liquid manure and their preparation

Amritpani

It a cost-effective formulation, serves as both organic fertilizer and a remedy for seed rots. Classified as a bioenhancer, it comprises diverse microbes, macro and micronutrients, plant growth-promoting hormones, enzymes, and vitamins. This composition not only enhances crop production but also improves the physical, chemical, and biological properties of the soil. Furthermore, Amritpani accelerates the decomposition process. To prepare it, a paste is prepared by mixing jaggery or honey with fresh cow dung, and then cow ghee added to it. This mixture is added to 200 liters of water, stirred thoroughly and left with the container sealed. After 7-10 days, it is ready for use.

Compost Tea

It serves as a natural fertilizer comprising soluble nutrients and beneficial microorganisms such as bacteria, actinomycetes, filamentous fungi, oomycetes, and yeasts. These microorganisms work synergistically to combat plant diseases, sustain soil fertility, and enhance agricultural productivity. In the preparation of compost tea, well decomposed compost (5 kg) is wrapped in a muslin cloth, submerging it into water (15 litres) for a period of 7-15, stirring it daily. This process fosters the development of a nutrient-rich concoction teeming with beneficial microorganisms. It

can be used as bio stimulant agents for promoting plant growth. The end product, compost tea, is versatile and can be applied directly through spraying or incorporated into fertigation methods, offering a holistic solution to enhance soil fertility and promote optimal agricultural productivity.

Compost tea

Himsol

This liquid manure is prepared by mixing water (200 l) and ash (250 gm) which is kept for 24 hrs. Later vermicompost (90 kg), cow dung (75 kg), cow urine (10 l) and ash (remaining 250 g) are added to this solution (consisting of water and ash) and kept in an airtight plastic container for around 3 months. Following this period, the resulting himsol, a liquid organic manure, is ready for use as a spray. This application not only safeguards soil health but also significantly contributes to improving both the quality and quantity of crops.

Himslurry

Him slurry, an organic liquid fertilizer, is composed of ingredients such as cow dung (40 kg), along with eggshells (200 gm), basalt powder (100 gm), and jaggery (50 gm). This blend is then mixed with matkakhad (200 ml) and undergoes a fermentation period of approximately 3 months. After the fermentation concludes, water is introduced at a ratio of 1 kg per 40 litres of water. The resulting slurry is continuously stirred for a minimum of 10 minutes to provide oxygen, fostering the growth of beneficial aerobic microbes within it.

Kunapajala

It stands out as an effective liquid organic fertilizer, offering two distinct preparation methods—one involving the fermentation of animal remnants such as bone marrow, animal flesh, and skin, yielding a strong odour, and the other utilizing a vegetarian base. This organic fertilizer significantly contributes to the growth and development of plants at various stages while enhancing soil fertility with its rich composition of macro and micro nutrients, sugars, fatty acids, and amino acids. For the vegetarian-based Kunapajala, a mixture of black gram (50 gm), groundnut oilcake (100 gm), rice husk (100 gm), soybean meal (100 gm) along with paneer (100 gm) and tofu (from soybean) (100 gm) is prepared by cooking in 1-1.5 litres of water for at least half an hour, followed by cooling. Cow dung (1 kg), cow urine (1 litre), honey (25 gm), milk (100 ml), and 20 litres of water are added to the cooked mixture, and the resulting blend is transferred to a 50-liter drum. Stirring this mixture twice daily is crucial throughout the fermentation period, which spans 20, 40, and 60 days. Upon completion of the fermentation process, the mixture is filtered using a cotton cloth.

Matkakhad

Matkahhad as the name suggests, is crafted within a earthen pitcher (20 l), containing cow dung (5 kg), water (5 l), cow urine (5 l), and jiggery (250 gm). This earthen vessel is then buried underground for 7-10 days, with only the mouth of the pitcher exposed above the ground and covered with a lid. The solution undergoes regular stirring during this period and becomes ready for use through drenching after 10 days. This organic liquid fertilizer not only enhances nutrient absorption but also serves as an excellent natural stimulant for promoting both vegetative and reproductive growth in plants.

Seaweed extract

It serves as a liquid organic fertilizer with dual benefits as a soil conditioner and a natural pest control method, while also fostering accelerated germination. This solution contributes to enhanced soil fertility and increased plant growth, owing to its abundant micronutrients and plant growth hormones. The preparation involves collecting washed-up seaweed, which is then immersed in tap water for a minimum of four weeks, with the bucket securely covered. Alternatively, the extract can be produced by crushing shade-dried seaweeds for five days, grinding them

into a coarse powder, boiling the powder in distilled water for at least 60 minutes, and subsequently straining the mixture.

Sasyagavya

It is an organic fertilizer, plays a vital role in boosting immunity against diseases throughout different crop growth phases. Additionally, it serves as a soil drenching agent before sowing, effectively preventing termite attacks on crops. To prepare Sasyagavya, combine fresh cow dung, cow urine, chopped organic waste, and wastewater in a ratio of 1:1:1:2. Allow the mixture to ferment in a container for 10-12 days, stirring it intermittently during this period.

Vermiwash

Vermiwash functions as an organic tonic obtained by passing water through a column of worm culture or vermi beds. This liquid incorporates excretory by-products, colemic fluid (secreted by earthworms for body moisture) and micronutrients sourced from soil organic molecules which helps to improve the physiochemical properties like soil structure, bulk density, soil aeration, water holding capacity of soil etc. With a wealth of micronutrients, macronutrients, various plant growth hormones like gibberellins, cytokinin etc, vermiwash supports optimal plant growth and enhances the absorption of nutrients.

Advantages

1. Providing a sustained source of nutrients in the soil, it fosters long-term and sustainable crop production.
2. It is a low-cost production approach which has demonstrated increased and superior yields.
3. Enhancing soil physical, chemical, and biological characteristics, it encourages the proliferation of beneficial microbes, thereby contributing to soil health.

Disadvantages

1. The supply of nutrients is constrained.
2. There is a strong and disagreeable odour.
3. If fermentation is not carried out thoroughly, it may lead to the accumulation of particular pathogens, posing a threat to plants and causing health problems in animals and humans

Conclusion

In the realm of modern agriculture, there is a clear prioritization of environmental sustainability. The utilization of organic liquid manures presents a sustainable livelihood alternative for small and marginal farmers as it is low-cost production technology which can be easily prepared from naturally and locally available inputs. The escalating reliance on chemical fertilizers and pesticides to meet the food demands of a growing population is adversely impacting crop quality and yield while posing potential risks to human health. By adopting eco-friendly, traditional, and affordable agricultural inputs for crafting organic liquid manures, there is an opportunity to revitalize age-old agricultural practices. This not only contributes to the production of safe and healthy food but also ensures environmental well-being, offering a balanced and sustainable approach to farming.

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