

ORGANIC INPUTS: NUTRITIOUS WAY FOR SUSTAINABLE AGRICULTURE

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Organic inputs products have got more value as compared to inorganic products. Indiscriminate use of chemical fertilizers put onward a serious threat to the environment and creates a health hazard, residue problem in soil health. Organic inputs avoid or largely exclude the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. Organic input can be contributed to meaningful socio-economic and ecologically sustainable agriculture, especially in developing countries.

Without the use of organic input and long-term application of chemical fertilizers could lead to serious problems for soil quality, nutritional imbalance, and deterioration of the rhizosphere micro-ecological environment further increased the activity of heavy metal ions in the soil. However, the excessive use of inorganic fertilizers worldwide is associated with the accumulation of contaminants, e.g. arsenic (As), cadmium (Cd), fluorine (F), lead (Pb) and mercury (Hg) in agricultural soils which are very chronic for the environment and human health (Udeigwe *et al.*, 2015). Many countries have reported alarming residues of agricultural chemicals in soil, water, air, agricultural products, and even in human blood and adipose tissue (Alvarez *et al.*, 2017). This is an unavoidable condition. If the farmer does not stop excessive use of chemicals, many losses occur in future such as soils are barren, difficult to breathe in a polluted environment and soon. Organic nutritious is a way to correct answer for the problems being faced by agriculture in India today.

Organic input has several benefits for farmers, including cheaper inputs, using domestic materials for making nutritious, rich organic manure. Organic cash crop production is, however, also associated with problems, including potentially reduced yields, compared to intensive conventional methods, the costs of certification and high labour requirements. Now time to aware the farmers about side effects of agrochemicals and convince them to reduce

the use of these chemical and adopt chemical-free inputs for sustainable production. Furthermore, systematically describe organic input such as Sanjivak, Jivamrut, Bijamrut, Panchagavya and Neemmastra methods and applications. Organic input is one of the several approaches found to meet the objectives of sustainable agriculture. Ecological friendly and environmental sustainability are closely intertwined and necessary components for truly sustainable agriculture. Hence discuss some important inputs which are farmers friendly and helpful to maximize crop productivity, improve soil fertility and environment.

Organic Inputs Procedure and Application

Organic inputs are the nutrient-rich substances, act as a growth promoter and protect the crop from pest and disease, without any residual effect on soil and environment. They contain all the properties like agrochemicals. Formulations of organic inputs are very easy and handy to use. They are eco friendly to nature. Some of the organic inputs as follows-

1. Sanjivak: Sanjivak solution has been prepared by mixing thorough of fresh cow dung- up to (400kg), fresh cow urine (200 lit), jaggary (1 kg), and water (600 lit). Take all the ingredients mix in a closed drum. Put it for ten days for fermentation. Dilute the solution 20 times with water. Ready Sanjivak solution was applied as soil spray or through irrigation. Three applications are needed one before sowing, second at 20 days after sowing and third at 45 days after sowing.

2. Jivamrut: Jivamrut solution has been prepared by mixing thorough of fresh cow dung (20 kg), fresh cow urine (20 lit), jaggary (1 kg), any pulse flour (4 kg) and water (200 lit). Take all the ingredients mix in a barrel. Put the solution for 5-10 days for fermentation. Shake the solution regularly three times a day after a fermentation solution is ready to use. The prepared solution has been applied through sprinkle on the soil or use with irrigation water. Apply the solution before sowing, second at 20 days after sowing and third at 45 days after sowing.

3. Bijamrut: Bijamrut solution has been prepared by mixing thorough of fresh cow dung (10 kg), fresh cow urine (10 lit), lime (500 gm), cow milk (1 lit) and water (200 lit). Mix cow dung, cow urine, cow milk and 500 gm lime in a drum. Add 200 lit water and mix thoroughly. Keep the solution overnight. Sprinkle the prepared solution over the seeds for treatment.

4. Panchagavya: Panchagavya solution has been prepared by mixing thorough of fresh cow dung slurry (4 kg), fresh cow dung (1 kg), fresh cow urine (3 lit), deshi ghee (1 kg), cow milk (2 lit) and water (100 lit). Take all the ingredients in a drum. Put the solution of 7-10 days for fermentation. Stir the solution 2-3 times per day. Dilute the 3 lit of panchgavya in 100 lit of water. Spray the solution over soil.

5. Neemmastra: Neemmastra solution has been prepared by mixing thorough of fresh cow dung (5 kg), fresh cow urine (12.5 lit), neem leaves (12.5 kg) and water (250 lit). Take 12.5 kg neem leaves and crush them in water. Add 5 kg fresh cow dung and 12.5 lit cow urine. Put the solution for 24 hr for fermentation. Stir the solution at regular interval. Filter the Extract and dilute to 250 litres. Use as a foliar spray for one hectare.

Benefits of Organic Inputs

- All organic input enriches microorganisms' population and activity in the soil
- Improve soil quality and fertility. It provides nutrient to plants and increase growth.
- Reduced the toxicity of heavy metal and decompose the residue quickly.
- It is used for seed treatment as protects the crop from seed-borne and soil-borne diseases. It improves seed germination.
- Panchagavya contains macro and micronutrients, many vitamins, essential amino acids, growth-promoting hormone-like IAA, GA, which may provide nutrition to rhizosphere microorganisms and thus help to enhance their population.
- It is useful against sucking pests and mealy bugs.

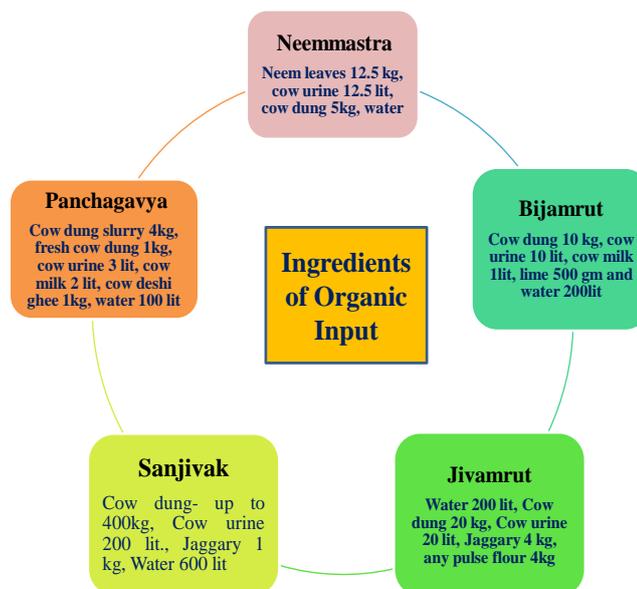
Impact of Organic Inputs on Crop Yield and Soil Health

S.No.	Organic Input	Findings	References
1.	Panchagavya	<p>1. Panchagavya contains primary macronutrients such as N, P and K, micronutrients, several vitamins, important amino acids and plant growth hormones like IAA, GA, which may provide nutrition to rhizosphere microorganisms and enhance their population.</p> <p>2. Foliar application of 3% panchagavya at 10 days intervals increases growth and yield attributes of chilli.</p>	<p>Natarajan (2007)</p> <p>Swain <i>et al.</i>, (2015)</p>

2.	Jivamruth	Jeevamruth contains huge amount of microbes which increases the microbial activity in soil.	Palekar, (2006)
3.	Bijamruth	Bijamiruth protect the crops from harmful soil and seed borne pathogens	Sreenivasa <i>et al.</i> (2009)
4.	Neemastra	20% neemastra found more effective against aphid, leafhopper, thrips and whitefly population in cotton.	Patel <i>et al.</i> , (2017)

Conclusion

Organic inputs are rich in quality properties. They have the potential of sustainable crop production, improve soil health and maintain the environmental quality. They provide healthy and nutritious food to human. The uses of these formulations proved beneficial in several crops and boosted the yield. Application of organic inputs based on soil test report and optimum use of water can help to increase productivity. An integrated approach is necessary to promote the highly valuable virtues and wide applications of organic inputs. These organic inputs are a new version of ancient science. These inputs are definitely a promising formulation in the years to come. This is a new concept to the scientific community for further validation and refinement of these practices in the present scenario to boost food and nutritional security as well as save the soil health and environment.



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