



Impact of Panchagavya on Crop Production

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Panchagavya is an organic product blended from five different cow products, commonly applied to crop plants in organic farming. It is used as foliar spray, soil application and seed treatment.

Introduction

Panchagavya has got reference in the scripts of Vedas (divine scripts of Indian wisdom) and Vrksayurveda (Vrksha means plant and ayurveda means health system). Panchagavya is the formulation mentioned in Ayurveda, which is prepared with five components derived from cow viz. Milk, Curd, Ghee, Urine and Dung. Panchagavya is an organic product blended from five different cow products, commonly applied to crop plants in organic farming. It is used as foliar spray, soil application and seed treatment. Panchagavya is also used as fertilizers and pesticides in agricultural operations. Panchagavya is an organic product recommended for crop improvement in organic agriculture. It is used as a foliar spray, soil application along with irrigation, as well as seed treatment. Panchagavya enhances metabolic activity of crop plants. The mixture of cow dung, butter, honey and ghee was reported to be beneficial in maintaining soil fertility and plant growth performance. The increase in population of plant growth promoting rhizobacteria (PGPR) under the influence of Panchagavya, they further suggested that, the possibility of the preferential utilization of nutritional element in the ingredient of Panchagavya.

Preparation of Panchagavya

Panchagavya is a special preparation made from five products of cow along with certain other ingredients (as given below) incubated for specific duration in an earthen or wide plastic container.

Ingredients for preparation used are

Fresh cow dung	-	5 kg
Cow urine	-	3 lit.
Cow milk	-	2 lit.
Cow curd	-	2 lit.
Cow ghee	-	500 g
Jaggery	-	500 g
Tender coconut water	-	2 lit.

Jaggery and coconut water used to accelerate fermentation.

Recommended Dosages of Panchagavya

Spray system: Three per cent solution was found to be most effective compared to the higher and lower concentrations investigated. Three litres of Panchagavya to every 100 litres of water

is ideal for all crops. The power sprayer of 10 litres capacity may need 300ml of Panchagavya per tank. After dilution the panchagavya solution has to be filtered before using it for spraying.

Flow system: The solution of Panchagavya can be mixed with irrigation water at 20 litres/acre, either through drip irrigation or flow irrigation.

Seed/seedling treatment: Three per cent solution of Panchagavya can be used to drench the seeds, soak or dip the seedlings before planting. 20 minutes soaking is sufficient. Rhizomes of turmeric, ginger and cuttings of sugarcane can be soaked for 30 minutes before planting. The three per cent Panchagavya solution can be used to dip the seeds before drying and storing them

Seed storage: The three per cent Panchagavya solution can be used to dip the seeds before drying and storing them.

Chemical and Biological Properties of Panchagavya

Chemical Composition		Microbial Load	
pH	5.15	<i>Fungi</i>	32 600/ml
EC dSm ²	12.41	<i>Bacteria</i>	18 30 000/ml
Total N (ppm)	241.00	<i>Lactobacillus</i>	23 20 000/ml
Total P (ppm)	205.00	<i>Totalanaerobes</i>	10 000/ml
Total K (ppm)	266.00	<i>Acidformers</i>	310/ml
Sodium	96.00	<i>Methanogen</i>	240/ml
Calcium	25.00		
IAA (ppm)	8.70		
GA (ppm)	3.10		

General Effects of Panchagavya on Plants

Leaf: Plants sprayed with *Panchagavya* invariably produce bigger leaves and develop dense canopy. The photosynthetic system is activated for enhanced biological efficiency, enabling synthesis of maximum metabolites and photosynthates.

Stem: The trunk produces side shoots, which are sturdy and capable of carrying maximum fruits to maturity. Branching is comparatively high.

Roots: The rooting is profuse and dense. Further they remain fresh for a long time. The roots spread and growth into deeper layers was also observed. All such root parameters help maximum intake of nutrients and water.

Yield: There will be yield depression under normal circumstances, when the land is converted to organic farming from inorganic systems of culture. The key feature of *Panchagavya* is its efficacy to restore the yield level of all crops when the land is converted from inorganic cultural system to organic culture from the very first year. The harvest is advanced by 15 days in all the crops.

It not only enhances the shelf life of vegetables, fruits and grains, but also improves the taste. By satisfying merchants and consumers on both the counts, the produce fetches a good price. By reducing or replacing costly chemical inputs, *Panchagavya* ensures economic gain and liberates the organic farmers from loans.

Nutrient uptake: Presence of macro (N, P, K and Ca) and micro (Zn, Fe, Cu, Mn) nutrients besides total reducing sugars (glucose) were observed in Panchagavya. Chemolithotrops and autotropic nitrifiers (ammonifiers and nitrifiers) present in panchagavya which colonize in the leaves increase the ammonia uptake and enhance the total N supply

Drought hardiness: A thin oily film is formed on the leaves and stems, thus reducing the evaporation of water. The deep and extensive roots developed by the plants allow the plants to withstand long dry periods. Both the above factors contribute to reduce the irrigation water requirement by 30% and to ensure drought hardiness.