



"ENHANCING VEGETABLE PRODUCTION BY USING PANCHAGAVYA

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Introduction:

Panchagavya, a fermented liquid bio-formulation. It is derived from Sanskrit word Panch mean five and gavya means cow. It made from cow-based products such dung, urine, milk, curd, and ghee, has become more widespread in agricultural practices recently, due to its purported potential to boost the output of vegetable crops. The organic matter in cow dung and urine can provide essential nutrients like nitrogen, phosphorus, and potassium to the soil, which are important for plant growth. Panchagavya contains plant growth- promoting substances such as vitamins, amino acids, hormones, and enzymes. Improved nutrient uptake, root development, and overall plant vigor are supported by these components.

Applying Panchagavya has also been shown to enhance soil health by increasing microbial activity, increasing the quantity of organic matter in the soil and fortifying soil properties. Beneficial micro- organism includes bacteria, fungus, and actinomycetes are essential to the cycling of nutrients, the

prevention of disease, and the conditioning of soil. The maximum microbial counts have been recorded in 7 days old preparation. Though a gradual reduction in the microbial counts was observed up to 50 days and the population reduced significantly after 30 days. However, it is desirable to use within 30 days of its preparation to obtain better results These soil enhancements have long-term favorable effects on soil fertility and sustainability. This diverse crop management strategy provides a comprehensive way to raise crop yield while lowering dependency on synthetic inputs.

The average nutrient contents

Parameter	Panchagavya
pH	5.45
N %	2366 (ppm)
P%	187 (ppm)
K%	1354 (ppm)
Ca (mg/l)	152
Mg (mg/l)	48
S (mg/l)	485
Mn (mg/l)	0.287
Zn (mg/l)	0.268
IAA ($\mu\text{g ml}^{-1}$)	4.45

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Microbial population of Panchagavya

Parameter	Panchagavya (cfu/ml)
Bacteria	12×10^4
Fungi	9×10^3
Actinomycetes	4×10^3
Azospirillum	2×10^2
Azotobacter	2×10^4
P solubilizer	9×10^5
K solubilizer	4×10^3
Pseudomonas	6×10^5
Rhizobium	6×10^4

Requirement for preparation of Panchagavya

Panchagavya is an organic product produced by using the use of five specific through-products of cow like cow dung (7 kg), cow urine (10 litres), cow milk (3 litres), cow ghee (1 kg), cow curd (2 litres), and other substances such as tender coconut water (3 liters), Jaggery (3 kg), well ripened poovan banana (12 nos.) and water (10 litres).

Jaggery and coconut water are used to promote the fermentation process which also help in minimizing the bad odour.

Preparation

- ✓ Panchagavya has to be prepared in a wide mouth container made of mud, concrete or plastic. The container should not be made of any metal

- ✓ First mix dung, Jaggery and melted Ghee.
- ✓ Then cover this mixture with moist cloth for 4 days.
- ✓ On 5th day add remaining ingredient & ferment for 15 days.
- ✓ Sufficient quantity of water & cattle urine to be added.
- ✓ After 20 days it will give nice smelling.
- ✓ Set aside for 24 hours.

Application of Panchagavya

1. **Spray system:** 3% solution is effective. 3 litres of Panchagavya mixed with every 100 litres of water is suitable for all crops.
 2. **Flow system:** The solution of Panchagavya can be mixed with irrigation water at 48-52 litres per hectare either through drip irrigation or flow irrigation.
 3. **Seed/seedling treatment:** 3% solution of Panchagavya can be used to soak the seeds or dip the seedlings before planting. Soaking the seeds or dipping the seedlings for 30 minutes is feasible.
 4. **Frequency of use:**
 - ✓ Before flowering- once in 15 days (two sprays)
 - ✓ Flowering stage- Once in 10 days (two sprays)
 - ✓ Fruit bearing stage- Once
- Time of application of Panchagavya for different vegetable crops is given as follows**

CROP	TIME SCHEDULE
Bhendi	30, 45, 60 and 75 days after sowing
Moringa	Before flowering and during pod formation
Tomato	Nursery and 40 days after transplanting: seed treatment with 1% for 12 hrs
Onion	0, 45 and 60 days after transplanting
Chilli	25, 50, 75 and 115 DAT
Cabbage and Cauliflower	Head development stage
Ridge gourd, Bitter gourd, Bottle gourd, Snake gourd, Cucumber	Before flowering and fruit developmental stage
Board bean, French bean, Cluster bean	At flowering and Pod developmental stage

Benefits of Panchagavya

1. **Nutrient supply:** Panchagavya contains various nutrients. These nutrients can be absorbed by plants which promotes their growth and development.
2. **Microbial activity:** Panchagavya contains certain beneficial microorganisms that can enhance the soil's microbial diversity these microbes may assist in nutrient cycling and make essential nutrients more available to plants.
3. **Enhanced root development:** Some proponents of panchagavya suggest that it promotes root development which can lead to improved nutrient and water uptake by plants stronger root systems can also make plants more resilient to environmental stress.
4. **Disease resistance:** The beneficial microorganisms in panchagavya may help suppress harmful pathogens reducing the risk of plant diseases this can lead to healthier and more vigorous plant growth.
5. **Stress tolerance:** Panchagavya is often used as a foliar spray and proponents claim that it can help plants to tolerate environmental stressors like drought, heat and pests.
6. **Improved flowering and fruit setting:** Increased flowering and better fruit setting when panchagavya is used potentially leading to higher yields. Yield enhancement by 18% and in few cases like Cucumber, the yield is doubled.
7. **Improved flavor:** Wholesome vegetables with shiny and appealing skin. Its very tasty with strong flavor.