Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 06, Issue: 02 (MAR-APR, 2026)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Panchgavya as a Natural Growth Promoter in Horticultural Crops

Kana Ram Sodh[1], Catherine Ezung[2], Priya[3], Durgesh Kumar Maurya[4] and *Gurbir Singh[5]
[1]Farm Manager, Krishi Vigyan Kendra Sardarshahar, Churu-1, Rajasthan
[2]Ph.D Scholar, Department of Horticulture (PSM), School of Agricultural Sciences, (Nagaland University), Medziphema Campus
[3]M. Sc. Scholar, Department of Horticulture (Vegetable Science), Birsa Agricultural University, Kanke, Ranchi, Jharkhand (834006)
[4]Subject Matter Specialist (Agronomy), Krishi Vigyan Kendra, Sant Kabir Nagar (U.P.)
[5]Assistant Professor, Horticulture (Fruit Science), PG Department of Agriculture, Khalsa College, Amritsar, Punjab, India
*Corresponding Author's email: gurbirsingh011@gmail.com

Panchgavya is a traditional organic formulation derived from five cow-based products, widely recognized for its importance in horticultural crop production. It acts as a natural manure, biopesticide, and plant growth promoter, supporting sustainable and eco-friendly farming systems. The application of Panchgavya enhances soil fertility by improving organic matter content, nutrient availability, and beneficial microbial activity in the rhizosphere. It also improves soil physical properties such as structure, porosity, and water-holding capacity. In horticultural crops, foliar application promotes better photosynthesis, leading to improved flowering, fruit set, and yield. Panchgavya also enhances nutrient uptake and stimulates root development, resulting in stronger and healthier plants. It plays a role in disease suppression and pest management due to the presence of beneficial microorganisms and bioactive compounds. Additionally, it improves the quality of produce by enhancing taste, aroma, and shelf life. The use of Panchgavya reduces dependence on chemical fertilizers and pesticides, supporting organic farming. However, its effectiveness may vary depending on soil type, crop, and application method. Overall, Panchgavya offers a promising, low-cost, and sustainable approach for improving horticultural productivity and quality.

Keywords: Panchgavya, Organic farming, Horticultural crops, Soil fertility, Microbial activity, Biopesticide,

Introduction

Panchgavya holds significant importance in both agriculture and horticulture due to its wide range of benefits. It serves as an effective natural manure and biopesticide in organic farming, while also offering potential as an alternative energy source and possessing notable medicinal properties. This organic formulation promotes plant growth and enhances resistance against diseases. The term Panchgavya, derived from Sanskrit, refers to a combination of five cow-derived products—milk, ghee, curd, dung, and urine—each known as "Gavya" and collectively forming Panchgavya. Its use has been documented in ancient texts such as the Vedas and Vrikshayurveda (Natarajan, 2002).

The concept of Panchagavya reflects a balanced and harmonious relationship among humans, nature, and livestock (Kumar and Singh, 2020). It functions as both an immunity enhancer and a growth promoter in the human body, while also supporting the growth and development of plants and zooplankton. The origins of Panchagavya can be traced to ancient

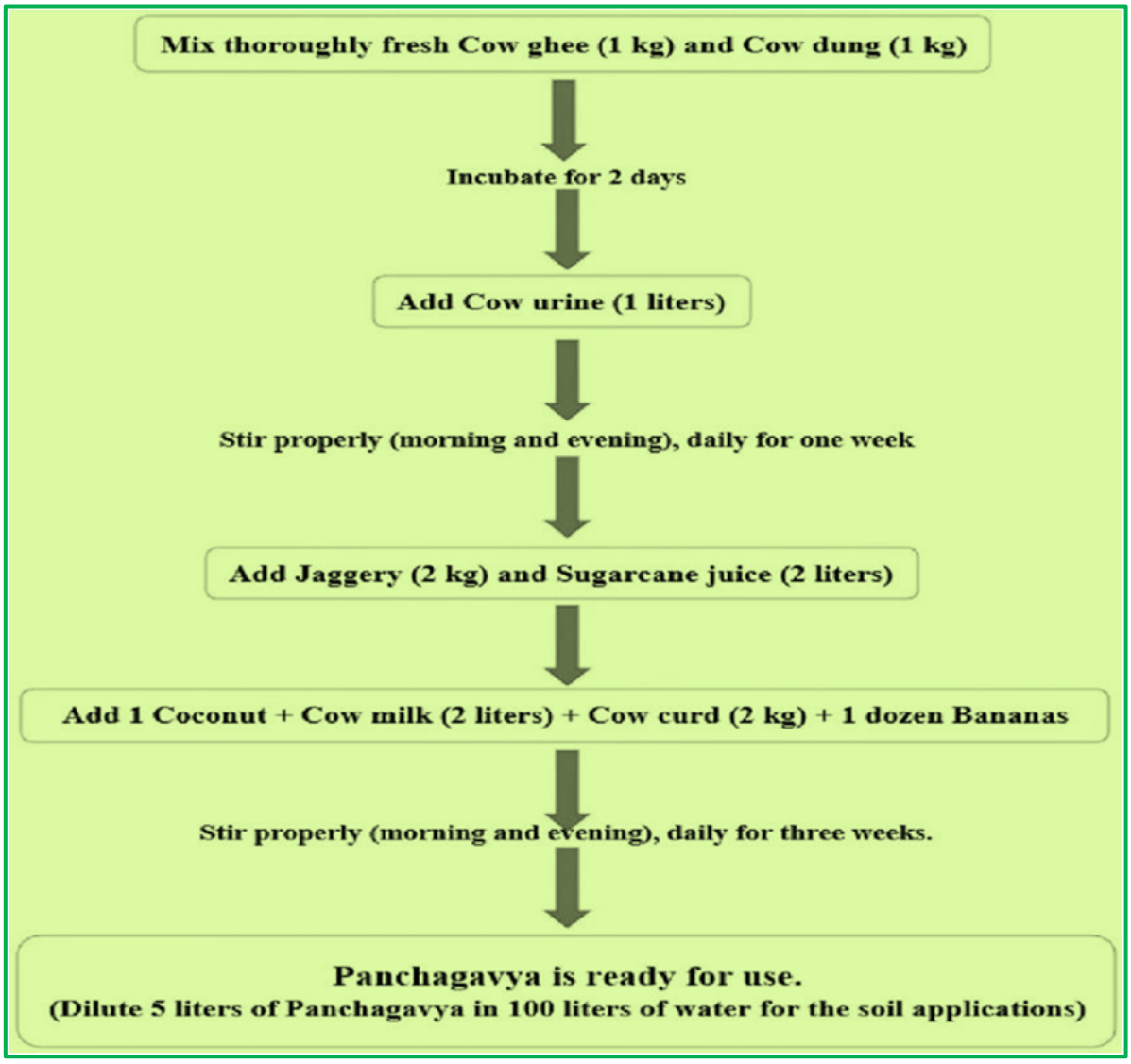
Indian traditions, where the cow has long been revered as a symbol of sustenance and life. Vedic texts highlight the importance of cows as providers of essential resources and nourishment.

Panchagavya, a formulation prepared from key cow-derived products, is believed to possess natural properties that improve soil health, stimulate plant growth, and contribute to human well-being. It has multiple beneficial applications in agriculture and organic farming, acting as an effective natural fertilizer and biopesticide. Additionally, it serves as a potential alternative energy source and exhibits valuable medicinal properties, along with functioning as a biofertilizer and pest repellent. Components such as cow urine and dung play a vital role in restoring soil micronutrients and fertility, thereby supporting the production of safer, chemical-free food.

Method of Panchgavya preparation

Classical Ayurvedic texts by Acharya Charak and Vagbhatacharya describe traditional procedures for the preparation of Panchgavya. These sources also highlight different formulations of Panchgavya and indicate that it can be used either alone or in combination with various medicinal herbs. Notable examples include Swalpa Panchgavya Ghrita and Maha Panchgavya Ghrita. The incorporation of herbs into Panchgavya is believed to enhance its therapeutic effectiveness and broaden its medicinal potential. The preparation includes ingredients such as cow dung, cow urine, cow milk, cow curd, and cow ghee, along with supplementary components like jaggery, banana, tender coconut, and water.

Flow chart for preparation of Panchagavya (Natarajan, 2002)



Method: Mix the cow dung (7 kg) and ghee (1 kg) thoroughly both in morning and evening hours for 3 days. After 3 days mix cow urine (10 L) and water (10 L) and keep it for 15 days with regular mixing both in morning and evening hours. After 15 days mix Cow milk (3 liters), Cow curd (2 liters), Tender coconut water (3 liters), Jaggery (3 kg) and well ripened banana (12 nos) and regularly mix both in morning and evening until 30 days.

Precautions: The container should be placed in a shaded area and covered with a wire mesh or plastic net to prevent houseflies from laying eggs and causing maggot formation in the mixture. The contents must be stirred twice daily, once in the morning and once in the evening, to ensure proper mixing. The Panchagavya stock solution becomes ready after about 30 days of preparation. It is important to avoid using products derived from buffalo. Additionally, materials obtained from indigenous cow breeds are considered more effective than those from exotic breeds.

Impact of panchagavya on soil fertility

Panchagavya plays a significant role in improving soil fertility by promoting the growth of beneficial microorganisms. It also enhances the water-holding capacity of plants, functioning effectively as an organic manure. The application of Panchagavya has been associated with improved nutrient uptake in plants. However, it is important to recognize that scientific evidence on its effects remains limited, and the outcomes may vary depending on factors such as soil type, crop variety, and methods of application.

Prospective effects of panchagavya on soil fertility

Readily available nutrients present in the rhizosphere zone surrounding plant roots: It has been observed that the application of Panchagavya to soil significantly influences the availability of phosphorus (P). The effect is most pronounced during the initial stages of treatment (up to 5 days after application), but gradually declines over time, eventually reaching levels similar to the control by the time of harvest. In contrast, the availability of micronutrients such as iron (Fe), zinc (Zn), manganese (Mn), and copper (Cu) remains consistently higher than the control throughout the entire crop growth period. Furthermore, applying Panchagavya to the soil at a rate of 3 L/m² has been found to enhance the availability of P, Fe, Cu, Zn, and Mn across all treatment levels.

Nutrient enrichment: Panchagavya is rich in nutrients and beneficial microorganisms. The organic components present in cow dung and urine supply essential elements such as nitrogen, phosphorus, and potassium, which are vital for plant growth. The application of Panchagavya as a 6% foliar spray, along with Jeevamrut as a soil treatment at 500 L/ha, has been reported to result in the highest nitrogen uptake by kernels (55.74 kg/ha). It also showed significantly greater nitrogen absorption in haulm (49.65 kg/ha) compared to other treatments. Cow urine, which is rich in uric acid and readily soluble, is one of the key components in Panchagavya and Jeevamrut that directly contributes to increased nitrogen content in plant leaves. Additionally, the regular stirring of the stock solution is believed to enhance its effectiveness by maintaining uniformity and supporting balanced physical, chemical, and biological processes.

Microbial growth activity: Cow dung and urine serve as rich sources of beneficial microorganisms. When Panchagavya is applied to the soil, it enhances microbial activity in the rhizosphere, the zone surrounding plant roots. These microorganisms help decompose organic matter, release essential nutrients, and improve soil structure (Mathivanan et al., 2006). Additionally, its application significantly increases total microbial population, improves residual soil fertility, and enhances the availability of nutrients such as phosphorus (P), potassium (K), and organic carbon (OC), along with the overall viable bacterial count in the soil. Therefore, Panchagavya can be recommended as an alternative nutrient source for organic farming (Patel et al., 2018).

Soil Conditioning: Panchagavya contributes to the improvement of soil structure and enhances its water-holding capacity. It promotes the formation of soil aggregates, which in turn improves soil aeration and drainage.

Disease suppression: Certain studies indicate that Panchagavya may exhibit disease-suppressing effects due to the presence of beneficial microorganisms. These microbes can inhibit or outcompete harmful pathogens, thereby reducing the occurrence of plant diseases.
Pest control: Panchagavya can function as a natural pest repellent, as the compounds and odors derived from cow urine and dung may discourage certain pests, thereby reducing reliance on chemical pesticides.
PH Balance: Cow urine possesses alkaline properties, and when applied to acidic soils, it can help neutralize the pH, thereby creating a more favorable environment for the growth of a wider range of crops.
Enhanced Nutrient: Panchagavya may enhance the nutrient absorption efficiency of plant roots by promoting mycorrhizal associations. These mycorrhizal fungi establish symbiotic relationships with plant roots, thereby improving the uptake of nutrients from the soil.

Human Health Benefits of Panchagavya

- It exhibits strong antimicrobial properties against bacteria, viruses, and fungi.
- It shows anticonvulsant effects and helps in managing neurological disorders.
- It acts as a natural detoxifier by purifying blood and removing toxins from the body.
- It is beneficial in treating various skin diseases such as eczema, psoriasis, acne, and itching.
- It supports digestive health by cleansing the intestines and improving digestion.
- It has anti-inflammatory effects helpful in conditions like arthritis and allergies.
- It promotes wound healing and acts as a disinfectant and preventive agent.
- It supports respiratory health and helps in conditions like asthma, cough, and sinusitis.
- It may help in managing chronic diseases such as diabetes, hypertension, and heart disorders.
- It improves physical strength, vitality, and overall well-being while enhancing longevity.
- It acts as a natural remedy for various ailments including fever, infections, and general body imbalances.

Benefits of Panchagavya in Agriculture

In horticultural crops, Panchgavya plays a vital role in improving soil fertility by enriching organic matter and increasing the availability of essential macro- and micronutrients. This is particularly beneficial for fruit, vegetable, and flower crops, which require well-balanced nutrition for optimal growth and yield. By stimulating beneficial microbial activity in the rhizosphere, Panchgavya helps maintain soil health and enhances nutrient uptake efficiency, leading to better plant vigor and productivity. It also improves soil structure by increasing porosity, stabilizing aggregates, and regulating pH, which is crucial for root development in crops like mango, citrus, tomato, and ornamental plants.

When applied as a foliar spray in horticultural crops, Panchgavya promotes the development of larger leaves and a denser canopy, thereby enhancing photosynthetic efficiency. This results in higher accumulation of photosynthates, which directly influences flowering, fruit set, and fruit development. It also encourages the growth of side shoots and branching, which is especially important in crops like grapes, guava, and pomegranate for increasing yield. Additionally, it supports deeper and stronger root systems, improving water and nutrient absorption, and helps maintain plant freshness and vigor over a longer period.

Panchgavya is highly beneficial in organic horticulture as it reduces dependence on synthetic fertilizers and pesticides, leading to the production of safe and chemical-free fruits and vegetables. It is particularly useful during the transition from conventional to organic farming, as it helps sustain crop productivity within a short time. Moreover, it enhances the quality attributes of horticultural produce, including taste, aroma, and shelf life, which are critical for market value. Its application can also lead to earlier harvesting by about 10–15 days and reduce input costs, thereby improving the overall profitability of horticultural farming systems.

Benefits of Panchagavya in Animals

Goats and Sheep

Goats and sheep showed improved health and rapid weight gain when given Panchagavya in doses of 10–20 ml per animal per day, depending on their growth stage.

Cows

When Panchagavya is mixed with animal feed and water at a rate of 100 ml per cow per day, it promotes better health in cattle, leading to increased milk yield, as well as higher fat and SNF (solid-not-fat) content. It also improves reproductive performance by enhancing conception rates. Additionally, the occurrence of issues such as retained placenta, mastitis, and foot-and-mouth disease is reduced. Regular use further improves the physical appearance of cows, resulting in shinier skin, increased hair growth, and an overall healthier look.

Poultry

When Panchagavya is mixed with feed or drinking water at a dosage of 1 ml per bird per day, poultry birds tend to become healthier and more resistant to diseases. It also enhances egg production, resulting in larger eggs over an extended laying period. In broiler chickens, its use leads to significant weight gain and improves the feed conversion ratio, indicating better efficiency in converting feed into body mass.

Conclusion

Panchgavya has proven to be an effective organic input for enhancing the growth, yield, and quality of horticultural crops. It improves soil fertility by increasing organic matter, nutrient availability, and beneficial microbial populations. Its role in enhancing soil structure and maintaining pH balance supports better root growth and nutrient absorption. Foliar application promotes photosynthetic efficiency, leading to improved flowering, fruiting, and overall productivity. Panchgavya also contributes to natural pest and disease management, reducing reliance on chemical inputs. It supports the production of safe, chemical-free fruits and vegetables with better shelf life and market value. The use of Panchgavya is particularly beneficial during the transition to organic farming systems. It also helps in reducing production costs and increasing farmers' profitability. Despite its many advantages, further scientific validation and standardization of application practices are required. In conclusion, Panchgavya is a sustainable and eco-friendly solution for improving horticultural crop production and ensuring long-term soil health.

References

1. Natarajan, K., (2002). Panchagavya–A Manual. Other Indian Press, Mapusa, Goa, India, pp: 333.
2. Kumar, C. S., & Singh, G. (2020). Effect of Panchagavya on Growth and Yield: A Review. *International Journal of Current Microbial Applied Science*, 9, 617-624.
3. Patel, D. M., Patel, I. M., Patel, B. T., Singh, N. K., & Patel, C. K. (2018). Effect of Panchgavya and jivamrut on yield, chemical and biological properties of soil and nutrients uptake by kharif groundnut (*Arachis hypogaea* L.). *International Journal of Chemical Studies*, 6(3), 804-809.
4. Mathivanan, R., Edwin, S.C., Viswanathan, K.R., & Chandrasekaran, D. (2006). Chemical, Microbial composition and antibacterial activity of modified panchagavya.
5. Rakesh S, Poonguzhali S, Saranya B, Suguna S, Jothibasu K. Effect of Panchagavya on growth and yield of abelmoschus esculentus cv. Arka Anamika. *International Journal of Current Microbiology and Applied Sciences*. 2017; 6(9):3090-3097.
6. Ali MN, Ghatak S, Ragul T. Biochemical analysis of Panchagavya and Sanjibani and their effect in crop yield and soil health. *Journal of crop and weed*, 2011;7(2):84-86.
7. Kumawat RN, Mahajan SS, Mertia RS, Meena OP. Green agriculture cultivation of groundnut (*Arachis hypogaea*) with foliar applied plant leaf extract and soil applied Panchagavya . *Indian Journal of Agricultural Sciences*. 2012;82(4):376- 380.