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TECHNICAL REPORT

DharAmrut GOLD

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DharAmrut Gold – Technical Note

1. Executive Summary

DharAmrut Gold is a multi-nutrient granular bio-stimulant that acts as a nutrient source, soil conditioner, and an adjuvant to enhance the use efficiency of major fertilizers such as Urea, DAP, MOP etc. It combines organic components (seaweed concentrate, humic, fulvic substances and organic carbon) with macro-, secondary-, and micronutrients, including phosphorus, calcium, magnesium, sulphur, silica, and essential trace elements. DA Gold does not work on the principle of fillers but only active ingredients. The fillers has been selected in such a way that they provide essential nutrients with good agronomic efficiency. The formulation is produced using biochemical activation and micronization technology, improving nutrient bioavailability, uniform soil distribution, and effective uptake by crops.

Technically due to the presence of mineral ingredients such as rock phosphate and basalt, DharAmrut Gold enhances phosphorus availability, releases plant-available silica from basalt, and improves soil physical, chemical, and biological properties. ICP–OES analysis confirms the presence of secondary nutrients such as calcium, magnesium, sulphur and trace elements such as zinc, boron, iron and these nutrients originate from the mineral excipients. ICP-OES also confirms that the heavy metals are well within permissible limits, validating product safety and regulatory compliance. The formulation also enhances the use efficiency of native and applied N, P, and K, supporting balanced crop nutrition and soil sustainability.

DharAmrut gold granules upon mixing with fertilizers urea, DAP, MOP etc enhances the use efficiency of nitrogen, phosphorus, potassium due to the presence of polymers, humates and fulvates. Field trials on maize, chilli, and tomato demonstrated consistent yield improvement, with increase of 10.9%, 13.2%, and 8.3%, respectively. These yield gains translated into higher gross income and favourable B:C ratios of 1:2.75 in maize and 1:4 in chilli and tomato, indicating strong economic returns, particularly in horticultural crops. Overall, the combined technical validation and field performance establish DharAmrut Gold as a eco-friendly, effective, and economically viable input that improves crop productivity while supporting long-term soil health and sustainable agriculture.

2. DA Gold: A Prelude

DharAmrut Gold is a multi-nutrient granular formulation that supplies essential nutrients to the crops that are derived from multiple sources such as seaweed algae, humates,

fulvates, sulphates, silicates and phosphates. The humic and fulvic compounds help in enhancing soil physical, chemical and biological properties. The mineral excipients provide silicates, phosphates, secondary and trace elements, which are needed for vigorous root and plant growth.

DharAmrut Gold granules are produced by combining two unique technologies such as biochemical activation and micronization of active ingredients. All vital nutrients are homogenized and activated through enzymatic reactions for enhanced bioavailability of bound nutrients. They are then further formulated as granules using micronized technology, which aids in particle size reduction, facilitating the effective entry and translocation of nutrients into plant systems.

DharAmrut Gold, besides being a source of nutrients, also enhances the absorption and use efficiency of N, P, and K by plants from soil. The silicate mineral in DharAmrut helps enhance photosynthetic efficiency and mitigate abiotic stress, leading to higher yields. Silicates also promote inorganic soil carbon sequestration.

3. Major nutrients/growth Promoting components and their agronomic significance

Components	Role in Plants
Fulvic acid	Enhances nutrient chelation and transport within the plant, improving uptake of macro- and micronutrients. Promotes root elongation, increases enzymatic activity, and improves stress tolerance under abiotic stress conditions. Acts as a natural bio-stimulant.
Organic Carbon	Acts as a key energy source for soil microbial populations, supporting nutrient mineralization and soil biological activity. Contributes to soil carbon sequestration and improves soil resilience and sustainability.
Nitrogen	Essential for vegetative growth, chlorophyll synthesis, and protein formation. Promotes leaf expansion, photosynthetic efficiency, and overall biomass accumulation.
Phosphorous	Plays a vital role in root development, energy transfer (ATP), flowering, and seed formation. Enhances early

	plant vigor and improves crop maturity and yield potential.
Potassium	Regulates enzyme activation, osmotic balance, and stomatal function. Improves water use efficiency, stress tolerance, disease resistance, and grain or fruit quality.
Calcium	Strengthens cell walls and membranes, improving structural integrity and reducing physiological disorders. Enhances root and shoot growth and improves nutrient uptake efficiency.
Magnesium	Central component of chlorophyll molecule and essential for photosynthesis. Activates numerous enzymes involved in carbohydrate metabolism and energy transfer.
Sulphur	Required for synthesis of essential amino acids, proteins, vitamins, and enzymes. Enhances nitrogen use efficiency and contributes to improved crop quality and oil/protein content.
Silica	Enhances plant tolerance to biotic and abiotic stresses by strengthening cell walls and reducing transpiration losses. Improves photosynthetic efficiency, lodging resistance, and contributes to soil carbon sequestration.
Zinc	Essential micronutrient involved in enzyme activation, hormone (auxin) synthesis, and protein metabolism. Promotes root growth, internode elongation, and reproductive development.
Boron	Plays a critical role in cell wall formation, membrane integrity, pollen viability, and sugar translocation. Essential for flowering, fruit set, and seed development.

The synergistic combination of organic constituents, macro-, secondary-, and micronutrients in the formulation ensures balanced crop nutrition, improved nutrient use efficiency, enhanced soil health, and sustainable yield improvement under diverse agro-climatic conditions.

4. *Unique Selling Proposition of DharAmrut Gold*

Most bio-stimulant granules currently available in the market contain more than 90% filler material with limited or no agronomic significance. In many cases, the active ingredient concentration is below 5%, which may not deliver a meaningful field-level response at the commonly recommended application rate of 10 kg/acre.

In contrast, DharAmrut Gold is formulated using agronomically functional mineral carriers such as rock phosphate, carbonates, basalt, silicates, humates, fulvates, and other secondary nutrient minerals, ensuring that even the carrier fraction contributes directly to crop and soil performance.

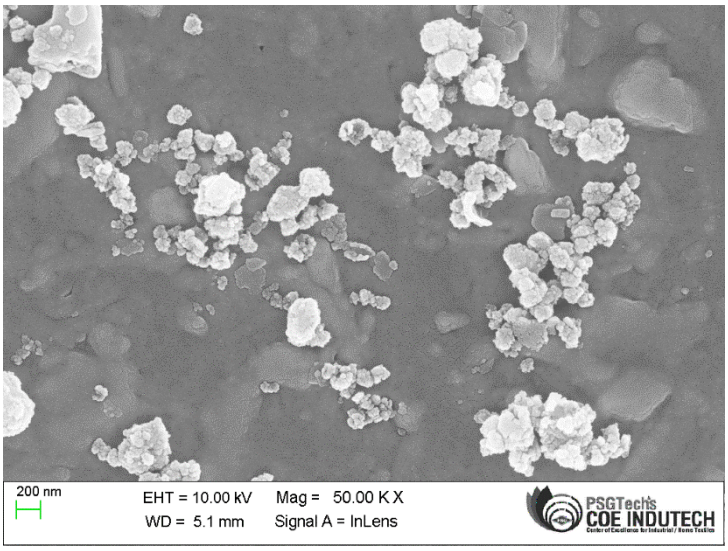
Additionally, all minerals in DA Gold are micronized to a particle size below 3 microns, resulting in higher surface area, better dispersion, and improved biological/metabolic activity, thereby enhancing nutrient availability and overall field performance.

Moreover, key minerals—particularly phosphates and silicates—are activated using a unique technology. When these activated minerals come in contact with moisture, they release their respective nutrients in a sustained and controlled manner, supporting continuous nutrient supply and improved crop response over time.

5. Particle size of micronized excipients in DA Gold granules

The particle size and surface morphology of micronized excipients in DA Gold granules were evaluated using Scanning Electron Microscopy (SEM) at 50,000× magnification (scale bar = 200 nm). The SEM micrograph showed the presence of fine, irregularly shaped particles distributed throughout the sample, with several particles forming small agglomerates/clusters.

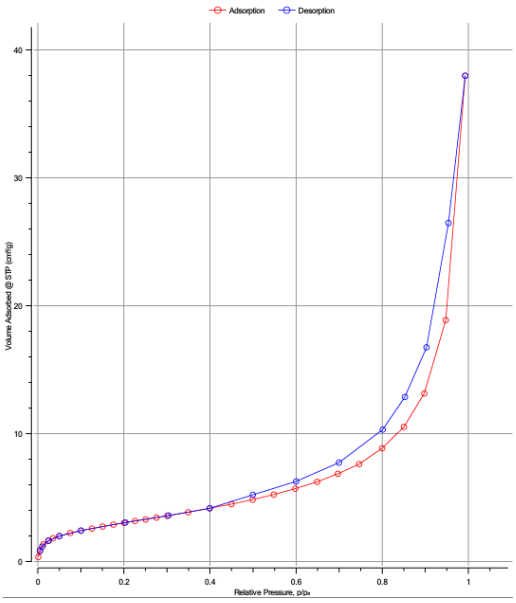
The observed particle dimensions were largely within the sub-micron range, confirming that the excipients were effectively processed through micronization technology. The rough and fragmented appearance of the particles indicates an increased surface area, which is expected to support better dispersion and improved mixing uniformity when integrated with conventional fertilizers during field application.



6. Surface area of micronized excipients in DA Gold granules (BET)

BET analysis showed that the micronized excipient had a higher surface area (11.434 m^2/g) and pore volume (0.0589 cm^3/g) compared to the conventional excipient (6.979 m^2/g and 0.0198 cm^3/g). This confirms that micronization significantly improves the porous structure and available surface area, which may support better nutrient interaction and availability in soil.

Materials	Surface area (m^2g)	Total Pore diameter (nm)	Total pore Volume
DharAmrut Gold excipients (Micronised technology)	11.431	20.60	0.0589
Conventional excipients	6.19	11.382	0.019



Importance of higher surface area

DA gold granules are cinstituted using constituents of particles with sub micron size with hugher surface area. The enhanced surface area brings reactive ions at surface resulting in higher entry transport and assimilation in plant system.

7. Method of application

DA Gold can be applied at a recommended dose of 10 kg per acre. It can be used both as a basal application at the time of sowing/transplanting and as a top dressing during crop growth stages. The product is applied by integrating with conventional N, P, and K fertilizers, and the exact timing and method may be adjusted based on the crop type and nutrient management schedule.

Advantages of mixing DharAmrut Gold with fertilizers

1. Humic and fulvic compounds act as polymeric encapsulating agents, thereby reducing nitrogen volatilization losses.

2. Other functional components in DA Gold act as nitrification inhibitors, helping to minimize nitrogen loss through leaching and denitrification.

3. Upon contact with moisture, DA Gold facilitates slow and sustained nutrient release, thereby enhancing nitrogen availability and improving overall nutrient use efficiency (NUE).

8. *Mode of Action and Unique Features of DharAmrut Gold*

DharAmrut Gold is a multi-nutrient granular formulation designed to enhance nutrient availability, improve nutrient use efficiency, and promote soil health through a combination of biochemical activation, mineral solubilization, and micronization technology.

Balanced Nutrient Supply

The formulation contains a broad spectrum of macro-, secondary-, micro-, and trace elements that collectively support balanced crop nutrition. This integrated nutrient profile ensures continuous availability of essential elements required for plant growth, metabolic functions, and yield formation, thereby minimizing nutrient imbalances in the soil–plant system.

Phosphorus Solubilization Mechanism

In most agricultural soils, phosphorus is predominantly present in insoluble or fixed forms, limiting its availability to plants. DharAmrut Gold has mineral activators that facilitate the conversion of unavailable soil phosphorus into plant-available forms. This process improves phosphorus uptake efficiency, enhances root development, and supports key physiological processes such as energy transfer and biomass accumulation.

Soil Conditioning through silica enrichment

The formulation contains silicate minerals derived from basalt (SiO_2), which are biochemically activated to release monosilicic acid ($Si(OH)_4$), the readily absorbable form of silicon. Monosilicic acid enhances plant structural strength, improves photosynthetic efficiency, and increases tolerance to abiotic stress. In addition, silicate minerals contribute to soil conditioning and promote inorganic soil carbon sequestration, supporting long-term soil sustainability.

Micronization Technology and Enhanced Use Efficiency

Advanced micronization technology is employed during the granulation process to reduce the particle size of active components. The micronized nutrients exhibit improved dissolution and distribution in the soil, leading to enhanced root contact and nutrient absorption. This technology enables higher nutrient use efficiency even at lower application rates, resulting in effective crop response and better value for farmers.

Functional Excipients and Fertilizer Compatibility

The excipients used in DharAmrut Gold possess intrinsic nutrient and agronomic value and are not merely inert carriers. These components support nutrient stabilization, sustained release, and improved soil physical and biological properties. The formulation is compatible with conventional fertilizers and can be co-applied to enhance the use efficiency of nitrogen (N), phosphorus (P), and potassium (K), thereby optimizing overall fertilizer performance.

9. *Regulatory requirements*

DharAmrut Gold is fully compliant with all statutory regulations governing agricultural inputs in India. Its regulatory status is clearly defined and supported by the necessary approvals:

1. Fertilizer Control Order (FCO) Classification: The product is officially classified under "Mixture of humic acid and sea weed extract (Granules)" of the Fertilizer Control Order (FCO).

2. Official Approvals and Licenses: FCO Approval: The necessary FCO approval for DharAmrut Gold has been obtained by IFFCO-NVPL. Manufacturing License: A valid manufacturing license has been granted by the Department of Agriculture.

3. Inclusion in 'O' Form: The formulation, under the trade name DharAmrut Gold, has been formally included in the 'O' Form (Undertaking-cum-Certificate) of IFFCO-NVPL, which has been approved by the Department of Agriculture.

10. *DharAmrut Gold composition as per the certificate of analysis*

FCO parameter	Unit	Test results	Specs limit as per FCO
Alginic acid	% (w/w)	0.06	Min. 0.02
Amino acid	% (w/w)	0.95	Min. 0.74
Humic acid	% (w/w)	0.90	Min. 0.83
Total Organic Carbon	% (w/w)	6.3	Min. 6.0
Bulk Density	g/cm³	1.1	1.0–1.2
pH (10% aqueous solution)	—	7.8	7.0–9.0
Solubility	%	46	Min. 44
Total Nitrogen	% (w/w)	1.35	-
Total Phosphorous	% (w/w)	3.2	-
Total Potassium	% (w/w)	1.8	-
Total Silica as SiO_2	% (w/w)	12.4	-
Total Calcium	% (w/w)	6.2	-
Total Magnesium	% (w/w)	2.5	-
Total Sulphur	% (w/w)	1.4	-
Total Zinc	ppm	3500	-
Total Boron	ppm	1400	-

11. *ICP OES studies for trace elements and heavy metals*

Heavy metals analysis showed the presence of arsenic (As) at 2.6 mg/kg and cadmium (Cd) at 1.67 mg/kg, both of which are non-essential and toxic, while chromium (Cr), mercury (Hg), and lead (Pb) were found below quantification limit (BQL) at 0.0003, 0.001, and 0.003 mg/kg, respectively, indicating negligible levels of these toxic metals. In addition, micro-nutrient analysis confirmed the presence of key plant-beneficial minerals including iron (Fe) at 11808.2 mg/kg supporting chlorophyll synthesis, respiration and enzyme activation; manganese (Mn) at 406.4 mg/kg acting as an enzyme activator in photosynthesis and nitrogen

metabolism; zinc (Zn) at 39.23 mg/kg supporting growth regulation and hormone synthesis; calcium (Ca) at 156652.6 mg/kg strengthening cell walls, improving root growth and enhancing nutrient uptake; magnesium (Mg) at 20993.5 mg/kg as a central component of chlorophyll essential for photosynthesis and enzyme function; sulphur (S) at 34419.8 mg/kg required for amino acid and protein formation and plant defense; and boron (B) at 1198.7 mg/kg important for cell wall formation, membrane integrity and pollen viability.

12. *Macronutrients*

The macronutrient analysis indicates the presence of essential primary nutrients in the formulation at agronomically relevant levels. Total nitrogen (1.35% w/w) contributes to vegetative growth, chlorophyll synthesis, and protein formation, supporting overall crop vigor. Phosphorus, present at 3.2 % w/w, plays a key role in root development, energy transfer, and reproductive processes, while potassium (1.83% w/w) is involved in enzyme activation, osmotic regulation, and stress tolerance.

The balanced presence of nitrogen, phosphorus, and potassium supports improved nutrient availability and use efficiency, contributing to sustained plant growth and productivity.

13. Soil metagenomics studies

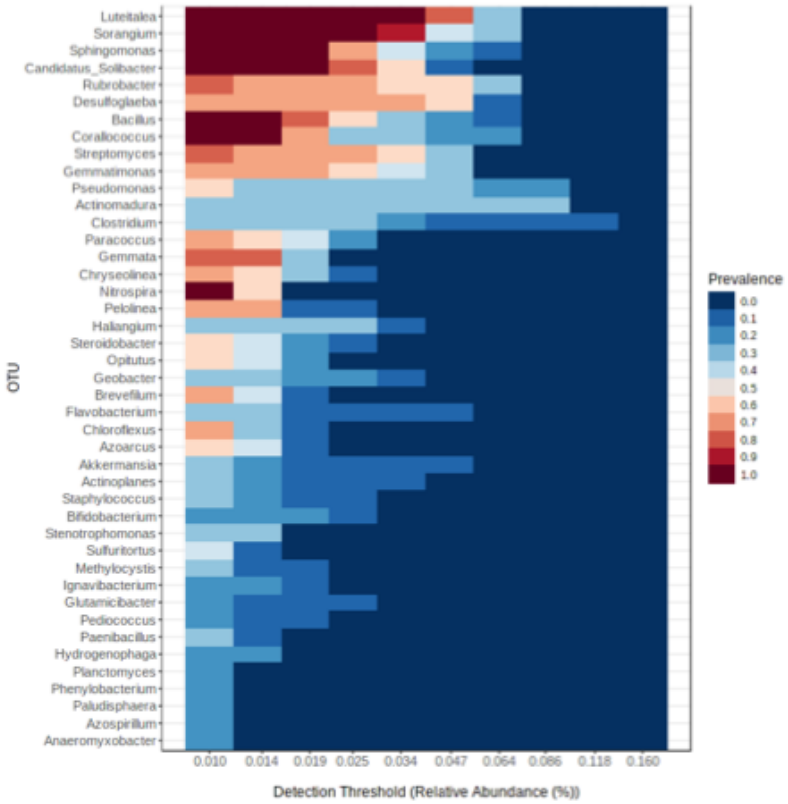
Metagenomic analysis of maize rhizosphere soil indicated that application of DharAmrut Gold positively influenced the soil microbial community by enriching beneficial bacterial populations. A higher abundance of plant growth–promoting and nutrient-cycling bacterial genera was observed in DharAmrut Gold–treated soils compared to the control.

Order Level – Taxonomy Plot Analysis

Notably, nitrogen-fixing bacterial groups were found in greater numbers following DharAmrut Gold application, suggesting enhanced enrichment of biological nitrogen fixation (BNF)–associated microbes in the rhizosphere. This increase in nitrogen-fixing species indicates improved microbial activity contributing to active nitrogen availability in the maize root zone.

Core Microbiome

The core microbiome refers to the set of taxa that are detected in a high fraction of the population above a given abundance threshold. The count data is transformed to compositional (relative) abundance in order to perform such analysis.



The data was visualized with the sample prevalence of 20% and relative abundance of 0.1 %.

Families Level – Taxonomy Plot Analysis

Among the dominant taxa, genera such as *Bacillus*, *Pseudomonas*, *Streptomyces*, Gemmatimonas, Nitrospira, and Desulfoglaeba showed higher prevalence, highlighting a diverse microbial community involved in nutrient cycling and soil health functions. Importantly, nitrogen-associated genera including Azoarcus, Azospirillum, and Paenibacillus were also observed, suggesting enrichment of nitrogen-fixing and nitrogen-transforming microbial groups in the rhizosphere.

Overall, the analysis confirms that DharAmrut Gold–treated maize rhizosphere supports a broad spectrum of beneficial bacterial genera, with several taxa remaining detectable even at higher abundance cut-offs, indicating their strong establishment and potential contribution to plant growth promotion.

14. Field-level validation of DharAmrut Gold in diverse agricultural and horticultural crops

The first phase of the field trial was initiated in three representative crops, namely tomato, chilli, and maize, to evaluate the field performance of DA Gold under practical agronomic conditions. During this phase, the application methodology and timing were standardized to ensure uniform delivery and consistent assessment across crops. DA Gold was applied through soil application by mixing with the recommended NPK fertilizers, followed by top dressing at crop-specific growth stages, i.e., 30 days after sowing (DAS) in maize, 45 days after transplanting (DAT) in chilli, and 40 days after transplanting (DAT) in tomato. This

approach was adopted to synchronize DA Gold application with key nutrient-demand stages and active root growth for improved uptake and response.

As part of the ongoing progress, continuous validation trials of DA Gold have been initiated across multiple crops and locations to further confirm its consistency, adaptability, and agronomic benefits under diverse soil and climatic conditions.

a) Maize (Zea mays)

Trial location	Thondamuthur, Coimbatore, India
Coordinates	10.9899° N, 76.8409° E
Year	2025
Season	Kharif season
Variety	MRM4065 (Mahyco)

Influence of DharAmrut Gold on the Yield of Maize

S. No.	Treatment details	Yield (Kg/Acre)
1	Control	2454
2	DharAmrut Gold	2723

Interpretation

Field evaluation of DharAmrut Gold in maize demonstrated a clear and agronomically meaningful improvement in crop productivity compared to the untreated control. Application of DharAmrut Gold resulted in a grain yield of 2723 kg acre^{-1}, whereas the control recorded 2454 kg acre^{-1}, reflecting an increase of approximately 11% under farmer field conditions.

This yield enhancement can be directly attributed to the balanced and activated nutrient profile of DharAmrut Gold. The presence of readily available phosphorus (6.51% w/w), supported by phosphorus-solubilizing biochemical components, likely promoted improved root development and early crop vigor, enabling better nutrient and water uptake throughout the growth period. Enhanced phosphorus availability is particularly critical in maize for energy

transfer (ATP synthesis) and biomass accumulation, which ultimately translates into higher grain yield.

The contribution of activated silica derived from basalt further strengthens the interpretation of improved performance. Biochemically released monosilicic acid enhances photosynthetic efficiency, strengthens cell walls, and improves tolerance to abiotic stresses such as moisture fluctuations and heat stress—common constraints in maize-growing environments. These effects collectively support improved canopy development, better assimilate partitioning, and reduced lodging risk. In addition, the presence of organic carbon, humic and fulvic compounds, and secondary nutrients (Ca, Mg, S) improved soil physical and biological properties, enhancing nutrient use efficiency of both native soil nutrients and applied fertilizers. The micronized granulation technology ensures uniform nutrient distribution in the root zone, facilitating effective nutrient absorption even at moderate application rates.

Overall, the observed yield increase in maize confirms that DharAmrut Gold functions not only as a nutrient source but also as a soil conditioner and nutrient use efficiency enhancer, leading to improved crop performance under real field conditions. The results validate its suitability as a sustainable input for maize cultivation, with potential to enhance productivity while improving soil health across diverse agro-climatic conditions.

b). Tomato (*Solanum lycopersicum*)

Trial location	Madhampatty, Coimbatore, India
Coordinates	10.9698° N, 76.8598° E
Year	2025
Season	Khariff season
Variety	Shivam hybrid

Influence of DharAmrut Gold on the Yield of Tomato

S. No.	Practice	Yield (t/ha)
1	Control	20.4
2	DharAmrut Gold	22.1

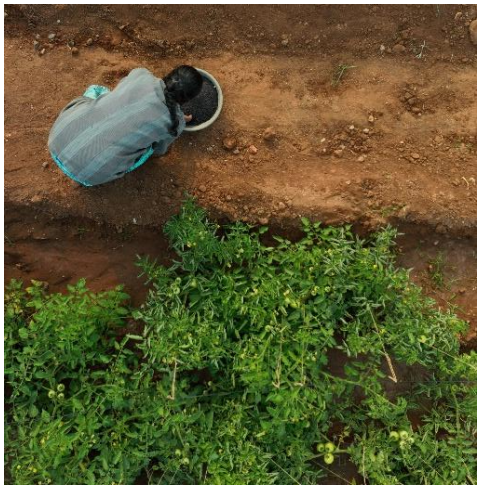
Interpretation

A field trial conducted during the Kharif season (2025) at Madhampatty, Coimbatore, India (10.9698° N, 76.8598° E) on tomato (Shivam hybrid) demonstrated a positive yield

response to the application of DharAmrut Gold under farmer field conditions. The treatment with DharAmrut Gold recorded a fruit yield of 22.1 t ha^{-1}, compared to 20.4 t ha^{-1} in the untreated control, representing an increase of approximately 8.3%.

The observed yield improvement can be attributed to the integrated multi-nutrient and bio-activated nature of DharAmrut Gold. Enhanced phosphorus availability from the formulation supports early root establishment and efficient energy transfer, which are critical for flowering and fruit set in tomato. The presence of calcium, boron, and magnesium plays a vital role in maintaining cell wall integrity, pollen viability, and photosynthetic efficiency, thereby reducing physiological disorders and improving fruit development.

Activated silica released from basalt-based silicate minerals further contributes to improved plant performance by strengthening plant tissues, reducing transpiration losses, and enhancing tolerance to abiotic stresses prevalent during the Kharif season, such as intermittent moisture stress and high temperature. Improved photosynthetic efficiency and canopy health likely contributed to better assimilate partitioning towards fruits, resulting in higher marketable yield.



c). Chilli (*Capsicum annum*)

Trial location	Madhampatty, Coimbatore, India
Coordinates	10.9698° N, 76.8598° E
Year	2025
Season	Khariff season
Variety	Royal Bullet (Syngenta)

Influence of DharAmrut Gold on the Yield of Chilli

Treatment	Total Yield (kg/ac)
Control	2815
DharAmrut Gold	3187

Interpretation

The field evaluation of DharAmrut Gold in chilli cultivation showed a clear improvement in total yield compared to the untreated control. Application of DharAmrut Gold resulted in a yield of 3187 kg acre^{-1}, whereas the control plot recorded 2815 kg acre^{-1}, corresponding to a yield increase of approximately 13.2% under field conditions.

This significant yield enhancement reflects the effectiveness of DharAmrut Gold as a multi-nutrient, bio-activated soil and crop nutrition formulation. Improved availability of phosphorus and potassium supports better root development, flowering, and fruit formation,

which are critical yield-determining stages in chilli. Nitrogen, along with magnesium and iron, enhances chlorophyll synthesis and photosynthetic efficiency, leading to improved biomass production and assimilate supply to developing fruits.

The presence of calcium and boron plays a crucial role in improving flower retention, pollen viability, and fruit set, thereby reducing flower drop and improving fruit number per plant. Activated silica derived from basalt contributes to stronger plant architecture, improved tolerance to abiotic stresses, and reduced transpiration losses, which are particularly important in chilli cultivation under variable moisture and temperature conditions.

In addition, humic and fulvic substances and organic carbon improve soil structure, microbial activity, and nutrient buffering capacity, enhancing overall nutrient use efficiency. The micronized granular formulation ensures uniform nutrient distribution in the root zone, allowing sustained nutrient availability throughout the crop growth cycle.

Overall, the observed yield advantage in chilli confirms that DharAmrut Gold effectively enhances nutrient availability, supports reproductive development, and improves stress tolerance, resulting in higher and more stable yields under practical field conditions. The results validate its suitability as a sustainable input for improving chilli productivity while simultaneously supporting long-term soil health.

i). Ongoing trials

Currently, DA Gold is under multi-crop field evaluation across onion, coriander, cotton, and rice to assess its performance under diverse agronomic conditions. These trials are being carried out to validate its influence on crop growth, nutrient use efficiency, plant vigour, and overall yield response, ensuring consistent results across different cropping systems.

Filed level validation of DA Gold in Onion

Filed level validation of DA Gold in Coriander

Filed level validation of DA Gold in Cabbage

ii) In coordination with State Agricultural Universities (SAUs)

DA Gold trials have also been initiated in collaboration with leading SAUs, including Tamil Nadu Agricultural University (TNAU) and the University of Agricultural Sciences (UAS). These studies are being conducted by PG students to scientifically evaluate the impact of DA Gold across different crops, with a focus on growth, nutrient response, and yield performance under varied conditions.

iii) In coordination with Krishi Vigyan Kendras (KVKs)

In addition, DA Gold trials have been initiated in farmers' fields through KVK coordination across multiple districts. The first phase of trials indicated a positive impact, and subsequent

trials are being expanded across different crops and locations to generate more reliable and consistent field-level validation.

Cost-Benefit Ratio

The BC ratio for the conducted trials covering the agricultural and horticultural crops is as follows,

Crop	Treatment details	Yield(kg/ac)	Gross income (₹)	% yield increase	BC ratio
Maize	Control	2454	49080		1:2.75
	DharAmrut Gold	2723	54460	10.9	
Chilli	Control	2815	84450		
	DharAmrut Gold	3187	95610	13.2	1:4
Tomato	Control	20.4	123900		
	DharAmrut Gold	22.1	134220	8.3	1:4

**DharAmrut Gold has been applied as a combined dose in basal and split doses given as two for the agricultural and horticultural crops (major vegetables).*

Interpretation

The cost–benefit analysis across maize, chilli, and tomato clearly indicates the economic advantage of DharAmrut Gold under field conditions. Application of DharAmrut Gold consistently improved crop yields, resulting in higher gross income and favorable B:C ratios. In maize, DharAmrut Gold increased yield by 10.9%, raising gross income from ₹49,080 to ₹54,460 and achieving a B:C ratio of 1:2.75, indicating profitable returns even in a cereal crop with moderate market value. In chilli, yield increased by 13.2%, with gross income rising from ₹84,450 to ₹95,610 and a B:C ratio of 1:4, reflecting strong economic gains in a high-value horticultural crop. Similarly, in tomato, DharAmrut Gold resulted in an 8.3% yield

increase, increasing gross income from ₹1,23,900 to ₹1,34,220 and achieving a B: C ratio of 1:4.

Overall, the results demonstrate that DharAmrut Gold provides consistent yield improvements and attractive economic returns, particularly in horticultural crops, supporting its suitability for adoption across diverse cropping systems.

Field-Level Technical Validation of DharAmrut Gold under Farmer Field Conditions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