

GOVERNMENT OF INDIA
MINISTRY OF CHEMICALS AND FERTILIZERS
DEPARTMENT OF FERTILIZERS

LOK SABHA

STARRED QUESTION NO. 492 TO BE ANSWERED ON: 27.03.2026

Impact of Balanced Nutrient Application

***492. Shri Praveen Patel:
Shri Rajkumar Chahar:**

Will the **Minister of CHEMICALS AND FERTILIZERS** be pleased to state:

- (a) the details of the grant mechanism whereby fifty per cent of the subsidy savings are passed on to the States/UTs and the specific infrastructure projects for which the said funds are likely to be utilized;
- (b) the status of the "Maha Abhiyan" conducted across various agro-climatic zones to promote adoption of alternative fertilizers like Nano Urea and Nano DAP (Diammonium Phosphate) in the country, State/district-wise including Karnataka;
- (c) whether the Government has evaluated the impact of balanced nutrient application on long-term soil health and crop productivity;
- (d) if so, the details thereof along with the results of the evaluation, State/district-wise including Karnataka;
- (e) the steps taken to integrate the Soil Health Card recommendations with the fertilizer supply plan to prevent over-application of nitrogenous fertilizers; and
- (f) the current status of the Bulk Drug Park being developed in Gujarat and the details of the Common Infrastructure Facilities (CIF) provided therein?

ANSWER

THE MINISTER IN THE MINISTRY OF CHEMICALS & FERTILIZERS
(SHRI JAGAT PRAKASH NADDA)

(a) to (f) A statement is laid on the table of the House.

STATEMENT REFERRED TO LOK SABHA STARRED QUESTION NO. 492 FOR 27.03.2026 REGARDING “Impact of Balanced Nutrient Application” TABLED BY SHRI PRAVEEN PATEL AND SHRI RAJKUMAR CHAHAR:

(a): The Cabinet Committee on Economic Affairs (CCEA), on June 28, 2023, approved the “PM Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother-Earth (PM-PRANAM). The initiative aims to support the mass movement initiated by States and Union Territories (UTs) to preserve the health of Mother Earth through the promotion of sustainable and balanced fertilizer use, adoption of alternative fertilizers, promotion of organic farming, and implementation of resource conservation technologies.

All States/UTs are covered under the PM-PRANAM scheme. Under the PM-PRANAM scheme, there is a provision to provide incentives to States/UTs for reduction of consumption of chemical fertilizers (Urea, DAP, NPK, MOP) in a given financial year, compared to the average consumption over the previous three years, equivalent to 50% of the fertilizer subsidy saved. Of the total grant, 95% will be allocated to the State, while provided to the States, 65% is for capital expenditure (capex) projects, preferably as contributions to Centrally Sponsored Schemes, and 30% is untied for other activities, including Information, Education, and Communication (IEC) initiatives.

(b): Department of Fertilizers (DoF) in collaboration with fertiliser companies, has launched **Maha Abhiyan** to promote the adoption of **Nano DAP** across all 15 Agro-climatic zones of the country through consultations & field-level demonstrations. Under the guidance of Indian Council of Agriculture Research (ICAR) and the supervision of ICAR-Krishi Vigyan Kendras (KVKs), IFFCO had conducted **2,500** Nano DAP Farmer Field Trials during *Kharif* and *Rabi* 2024–25 and **2,938** Nano DAP Farmer Field Trials during *Kharif* and *Rabi* 2025-26 (till 23.03.2026) across 15 Agro-Climatic Zones (ACZs) of the country.

Additionally, DoF in collaboration with fertiliser companies, has initiated a nationwide campaign for field-level demonstrations and awareness programmes on **Nano Urea Plus** in 100 districts. IFFCO had conducted **448** Nano Urea Farmer Field Trials during *Kharif* and *Rabi* 2024–25 and 484 Nano Urea Farmer Field Trials during *Kharif* and *Rabi* 2025-26 (till 23.03.2026) across 15 Agro-Climatic Zones (ACZs) of the country under the guidance of Indian Council of Agriculture Research (ICAR) and the supervision of ICAR-Krishi Vigyan Kendras (KVKs).

The State wise, Agroclimatic Zone (ACZ) wise, Nano Fertilisers Field Trials, including Nano Urea and Nano DAP are placed at **Annexure I** (Kharif, 2024 (April to September-2024)), **Annexure II** (Rabi, 2024-25, (Oct-2024 to Mar-2025)), **Annexure III** (Kharif, 2025 (April to September-2025)) and **Annexure IV** (Rabi, 2025-26 (Oct-2025 to Mar-2026, as on 23.03.2026)).

(c) and (d): Karnataka State Agriculture Universities have undertaken 2 long term experiments at University of Agricultural Sciences (UAS), Gandhi Krishi Vigyana Kendra (GKVK), Bangalore, which are as under:

(i) Long Term Fertilizer Experiments are under progress since 1986 at All India Coordinated Research Projects (AICRP) on Long-Term Fertilizer Experiments (LTFE), UAS, GKVK, Bangalore to study changes in soil quality, crop productivity and sustainability in Alfisols under finger millet-maize cropping system. The results of the experiments are attached at **Annexure V**.

(ii) Long Term Fertilizer Experiments are under progress since 1978 at All India Coordinated Research Projects (AICRP) on Dry land Agriculture, UAS, GKVK, Bangalore to study the changes in soil quality, crop productivity and sustainability under finger millet monocropping and finger millet-groundnut crop rotation.

In addition to this, long-term studies conducted by Indian Council of Agricultural Research (ICAR) at various locations across diverse agro-ecological regions of the country demonstrate the impact of balanced nutrient application on soil health and crop productivity. The findings indicate that recommended NPK application (100% NPK) improves crop yields by about 20–30 per cent over nitrogen-only use, while integrated nutrient management (100% NPK + farmyard manure) further enhances productivity by 30–50 per cent over control plots. Soil organic carbon is highest under integrated nutrient management, improving by about 0.1–0.3 percentage points over long-term nitrogen-only treatments, indicating better soil health. Microbial biomass carbon is also significantly higher, by 20–40 per cent, under integrated nutrient management compared to chemical fertilizers alone. In contrast, continuous nitrogen-only application leads to declining yields and deterioration of soil properties over time.

Further, under All India Coordinated Research Project on Soil Test Crop Response (AICRP-STCR), soil test-based balanced fertilizer prescription equations have been developed for major crops to enable site-specific nutrient management based on soil fertility and farmers' resources. Coordinated programmes also promote balanced fertilization and integrated nutrient management through training, demonstrations, and awareness activities. Overall, balanced and integrated nutrient application is essential for sustaining soil fertility, improving crop productivity, and ensuring environmental sustainability.

(e): The farmers can purchase their required amount of subsidized fertilizers based on the recommendation of Soil Health Card received by them through any fertilizers retail shop/ Pradhan Mantri Kisan Samridhi Kendra (PMKSK). The subject matter of Soil Health Card falls in the purview of Department of Agriculture & Farmer's Welfare and no such proposal of integrate Soil Health Card recommendations with fertilizers supply plan has yet been received from the administrative Ministry.

(f): Under the "Promotion of Bulk Drug Parks" scheme, one bulk drug park in Jambusar, Bharuch, and Gujarat was approved in FY 2022-23. Financial assistance from the Central Government is provided for creation of Common Infrastructure Facilities (CIF), subject to a maximum of ₹1,000 crore per park, or 70% of the project cost, whichever is lower.

- (a) Total project cost: ₹2,507.02 crore
- (i) CIF project cost: ₹1,457.01 crore (₹1,000 crore is grant from the Central Government)
- (ii) Physical infrastructure cost (other than CIF): ₹1,050.01 crore
- (b) Area: 2,015.02 acres, at Jambusar, Bharuch District, Gujarat
- (c) Major CIF being developed under the scheme includes steam generation and supply, common effluent treatment plant, centre of excellence, solvent recovery facility, treatment, storage and disposal facilities, raw water supply and effluent collection pipeline, infrastructure of roads and internal drains. Common infrastructure of marine discharge and power infrastructure are being executed with state funds.

Financial & Physical Status:

The State Implementing Agency, Gujarat Industrial Development Corporation, as on 28.02.2026, has utilised ₹341.44 crore out of the two instalments of ₹300 crore each received as Central Grant-in-Aid, and ₹206.92 crore out of ₹274.20 crore from State funds, towards the development of CIF.

The present status of progress of the CIF under Gujarat bulk drug park is as under:

- The environmental clearance was granted to the Gujarat Bulk Drug Park in February 2024. All the common infrastructure facilities related civil tenders, such as road, drainage, water infrastructure, effluent collection and rack system are awarded and approximately most of the work has been completed on site.
- CIF Utility tenders like Common Effluent Treatment Plant (CETP), Solvent Recovery, Treatment Storage & Disposal Facilities, have also been awarded and a small portion of the work has been completed on site. Tender of parking has been awarded in November, 2025.
- Tender of Steam Generation is released and which is under evaluation.
- In addition to above CIF work, State Implementing Agency (SIA) has completed construction of an approach road of 4 km and has initiated the installation of a water pipeline to draw surface water from the Narmada Canal, located approximately 40 km from the Bulk Drug Park site.

Annexure-I

Annexure referred to in reply to part (b) of Lok Sabha Starred Question No. 492 for answering on 27.03.2026

State wise, Agroclimatic Zone (ACZ) Wise, Nano Fertilisers Field Trials by IFFCO (in nos.) during KHARIF, 2024 (April to September-2024)							
S. No.	State	Nano Urea Plus		Nano DAP		Grand Total	
		Targeted	Trials Conducted	Targeted	Trials Conducted	Targeted	Trials Conducted
1	Andhra Pradesh	4	4	40	39	44	43
2	Andman & Nicobar			5	5	5	5
3	Arunachal Pradesh			1	1	1	1
4	Assam	4	4	55	55	59	59
5	Bihar	8	8	100	100	108	108
6	Chhattisgarh	6	6	20	20	26	26
7	Gujarat	12	12	80	80	92	92
8	Haryana	10	11	50	52	60	63
9	Himachal Pradesh	4	4	20	20	24	24
10	Jammu And Kashmir	0	4	20	19	20	23
11	Jharkhand	4	4	20	20	24	24
12	Karnataka	8	8	80	80	88	88
13	Kerala	2	2	20	16	22	18
14	Madhya Pradesh	10	10	80	80	90	90
15	Maharashtra	12	12	90	90	102	102
16	Manipur			2	2	2	2
17	Mizoram			8	8	8	8
18	Odisha	4	4	60	60	64	64
19	Punjab	14	14	50	50	64	64
20	Rajasthan	14	14	60	60	74	74
21	Tamil Nadu	14	14	85	86	99	100
22	Telangana	10	10	40	40	50	50
23	Tripura			4	4	4	4
24	Uttar Pradesh	44	44	150	150	194	194
25	Uttarakhand	6	6	59	59	65	65
26	West Bengal	10	10	70	70	80	80
27	G Total	200	205	1270	1266	1470	1471

Annexure-II

Annexure referred to in reply to part (b) of Lok Sabha Starred Question No. 492 for answering on 27.03.2026

State wise, Agroclimatic Zone (ACZ) wise, Nano Fertilisers Field Trials by IFFCO (in nos.), during RABI, 2024-25, (Oct-2024 to Mar-2025)							
S. No.	State	Nano Urea Plus		Nano DAP		Grand Total	
		Targeted	Trials Conducted	Targeted	Trials Conducted	Targeted	Trials Conducted
1	Andhra Pradesh	4	7	40	43	5	6
2	Andman & Nicobar			5	6		
3	Arunachal Pradesh			1	1	1	1
4	Assam	4	20	55	55	59	75
5	Bihar	8	8	100	105	108	113
6	Chhattisgarh	6	7	20	19	26	26
7	Gujarat	12	12	80	80	92	92
8	Haryana	10	9	50	53	60	62
9	Himachal Pradesh	4	4	20	20	24	24
10	Jammu And Kashmir		4	20	20	20	24
11	Jharkhand	4	6	20	20	24	26
12	Karnataka	8	4	80	48	88	52
13	Kerala	2	2	20	15	22	17
14	Madhya Pradesh	10	10	80	80	90	90
15	Maharashtra	12	12	90	92	102	104
16	Manipur			2	2	2	2
17	Mizoram			8	8	8	8
18	Odisha	4	4	60	62	64	66
19	Punjab	14	14	50	50	64	64
20	Rajasthan	14	35	60	60	74	95
21	Tamil Nadu	14	14	85	84	99	98
22	Telangana	10	10	40	40	50	50
23	Tripura			4	3	4	3
24	Uttar Pradesh	44	46	150	150	194	196
25	Uttarakhand	6	5	59	48	65	53
26	West Bengal	10	10	70	70	80	80
27	G Total	200	243	1270	1234	1470	1477

Annexure-III

Annexure referred to in reply to part (b) of Lok Sabha Starred Question No. 492 for answering on 27.03.2026

State wise, Agroclimatic Zone (ACZ) wise, Nano Fertilisers Field Trials by IFFCO (in Nos.) during KHARIF, 2025 (April to September-2025)							
S. No.	State	Nano Urea Plus		Nano DAP		Grand Total	
		Targeted	Trials Conducted	Targeted	Trials Conducted	Targeted	Trials Conducted
1	Andhra Pradesh	4	4	40	41	44	45
2	Andman & Nicobar			5	0	5	0
3	Arunachal Pradesh			1	1	1	1
4	Assam	4	4	55	57	59	61
5	Bihar	8	8	100	104	108	112
6	Chhattisgarh	6	7	20	22	26	29
7	Gujarat	12	12	80	80	92	92
8	Haryana	10	10	50	57	60	67
9	Himachal Pradesh	4	4	20	20	24	24
10	Jammu And Kashmir	0	5	20	20	20	25
11	Jharkhand	4	6	20	21	24	27
12	Karnataka	8	15	80	80	88	95
13	Kerala	2	1	20	12	22	13
14	Madhya Pradesh	10	10	80	76	90	86
15	Maharashtra	12	11	90	84	102	95
16	Manipur			2	2	2	2
17	Mizoram	0	1	8	8	8	9
18	Odisha	4	4	60	60	64	64
19	Punjab	14	14	50	50	64	64
20	Rajasthan	14	35	60	63	74	98
21	Tamil Nadu	14	17	85	71	99	88
22	Telangana	10	10	40	40	50	50
23	Tripura			4	4	4	4
24	Uttar Pradesh	44	52	150	134	194	186
25	Uttarakhand	6	5	59	35	65	40
26	West Bengal	10	10	70	70	80	80
27	G Total	200	245	1269	1212	1469	1457

Annexure-IV

Annexure referred to in reply to part (b) of Lok Sabha Starred Question No. 492 for answering on 27.03.2026

State wise, Agroclimatic Zone (ACZ) wise Nano Fertilisers Field Trials by IFFCO (in Nos.), during RABI, 2025-26 (Oct-2025 to Mar-2026, as on 23.03.2026)							
S. No.	State	Nano Urea Plus		Nano DAP		Grand Total	
		Targeted	Trials Conducted	Targeted	Trials Conducted	Targeted	Trials Conducted
1	Andhra Pradesh	4	4	40	40	44	44
2	Andman & Nicobar			5	0	5	0
3	Arunachal Pradesh			1	1	1	1
4	Assam	4	4	55	55	59	59
5	Bihar	8	9	100	100	108	109
6	Chhattisgarh	6	3	20	19	26	22
7	Gujarat	12	12	80	80	92	92
8	Haryana	10	10	50	58	60	68
9	Himachal Pradesh	4	4	20	20	24	24
10	Jammu And Kashmir	0	5	20	20	20	25
11	Jharkhand	4	4	20	20	24	24
12	Karnataka	8	8	80	80	88	88
13	Kerala	2	2	20	20	22	22
14	Madhya Pradesh	10	10	80	83	90	93
15	Maharashtra	12	19	90	92	102	111
16	Manipur			2	2	2	2
17	Mizoram			8	8	8	8
18	Odisha	4	4	60	60	64	64
19	Punjab	14	15	50	50	64	65
20	Rajasthan	14	39	60	62	74	101
21	Tamil Nadu	14	15	85	85	99	100
22	Telangana	10	10	40	40	50	50
23	Tripura			4	4	4	4
24	Uttar Pradesh	44	47	150	153	194	200
25	Uttarakhand	6	5	59	50	65	55
26	West Bengal	10	10	70	70	80	80
27	G Total	200	239	1269	1272	1469	1511

Annexure referred to in reply to part (c) and (d) of Lok Sabha Starred Question No. 492 for answering on 27.03.2026

Results of Experiment

1. Incorporation of FYM along with optimal dose of NPK, improved soil physical properties (Soil aggregates, bulk density, total porosity and hydraulic conductivity).
2. The practice of applying only fertilizers has resulted in considerable drop down in soil pH, especially with higher levels of NPK and N alone.
3. Application of FYM as soil amendment is more effective than lime as former has not only moderating effect but also supplies nutrients like N, P, K and other micronutrients.
4. Buildup of available phosphorus is recorded in plots treated with 100% and 150% dose of P while, marginal buildup of K is recorded in plots that received 100% potassium.
5. Reduced level of phosphorus application (50% P) would be beneficial in terms of saving fertilizers as well as sustaining the crop productivity in P buildup soils.
6. Available S content in soil markedly increased when SSP fertilizer was given as P source but decreased when treated with DAP. Sulphur deficiency was observed due to continuous application DAP fertilizer as P source.
7. There was a marginal decline of Ca content in soil in all treatments except those treated with lime and FYM.
8. Deficiency of micronutrients is not found as the balanced application of nutrients using organic manure is taking care of micronutrients by mobilization from the reserve source of residual bio-mass added to soil.
9. Balanced and integrated use of nutrients improved soil organic carbon status, the beneficial microbiological population and enzyme activities in soil.
10. The minimum amount (threshold) of carbon required to maintain initial carbon level in soil is dependent on initial content of carbon in soil and climate and it was found to be 3600 kg/ ha/year.
11. Integrated use of inorganic fertilizers and organic manures not only sustained the soil productivity on long term basis but also improved the nutrient use efficiency.
12. The sustainable yield index (SYI) of maize and finger millet over the years is found highest in the plots which received NPK+FYM+lime and 150% NPK, respectively.

13. Higher Soil Quality Index is recorded in T10 (NPK+FYM+ lime) followed by T8 (NPK+FYM) treatments and lower SQI is recorded in control and imbalanced treatments.

14. Soil pH, K, Ca, Mg and microbial biomass carbon are important soil indicators to be taken care of for improving soil quality. Practical Significance: Applying the optimal dose of fertilizers integrated with organic sources such as FYM is essential for sustaining crop productivity and improving long-term soil health. Indiscriminate or imbalanced use of nitrogenous fertilizers drastically reduces yield and leads to significant deterioration of soil health. Farmers should be discouraged from applying only nitrogen and phosphorus fertilizers (such as DAP and urea) for finger millet. The inclusion of potassium, along with recommended doses of nitrogen and phosphorus, is crucial for achieving sustained higher yields. The commonly used high-analysis fertilizer DAP should be supplemented with secondary nutrients, as continuous reliance on DAP alone has contributed to widespread secondary nutrient deficiencies. Continuous application of the recommended dose of phosphorus has been observed to cause soil phosphorus buildup. In such situations, applying half the recommended phosphorus dose is sufficient to meet the crop's needs without compromising yield.

(Source: UAS, GKVK, Bengaluru)

Practical Significance:

- Applying the optimal dose of fertilizers integrated with organic sources such as FYM is essential for sustaining crop productivity and improving long-term soil health.
- Indiscriminate or imbalanced use of nitrogenous fertilizers drastically reduces yield and leads to significant deterioration of soil health.
- Farmers should be discouraged from applying only nitrogen and phosphorus fertilizers (such as DAP and urea) for finger millet. The inclusion of potassium, along with recommended doses of nitrogen and phosphorus, is crucial for achieving sustained higher yields.
- The commonly used high-analysis fertilizer DAP should be supplemented with secondary nutrients, as continuous reliance on DAP alone has contributed to widespread secondary nutrient deficiencies.
- Continuous application of the recommended dose of phosphorus has been observed to cause soil phosphorus buildup. In such situations, applying half the recommended phosphorus dose is sufficient to meet the crop's needs without compromising yield.