

Improved Nutrient Management Practices in Rice, Vegetables & Mustard Crops in Assam

(IFDC's Interventions Under APART Project)

Rice

Recommended Dosage of Nutrients

Crop (Kind)	Nutrient /Fertilizer Type	Recommended Dosage (Kg)					
		Ha			Bigha		
Sali	N: P: K	60	20	40	8	3	5
	Urea: DAP: MoP	113	43	67	15	6	9
Boro (Normal)	N: P: K	60	30	30	8	4	4
	Urea: DAP: MoP	105	65	50	14	9	7
Boro (Hybrid)	N: P: K	100	60	60	13	8	8
	Urea: DAP: MoP	166	130	100	22	17	13

FDP Briquettes

❖ For line-transplanted paddy

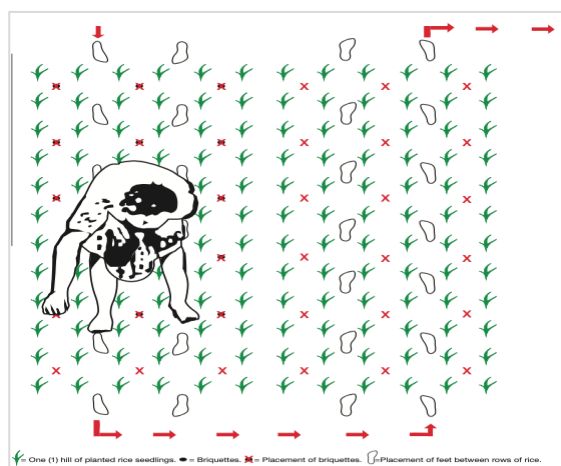
- Place NPK briquettes of size 2.7 gm each at 7-10 cm (3-4 inch) deep at the root zone by handheld applicator OR self-propelled applicator OR transplanter-mounted FDP applicator, etc.
- Transplant seedlings in lines, keeping 20cm (R) X 15cm (P) spacing.
- Place fertilizer briquettes within 5-7 days after transplanting.
- To make the placement easier, choose a time when there is only one inch (2-3 cm) of water in the field.
- Keep enough briquettes in the container to fill one entire row.
- Start at the right-hand side of the field. Push the briquettes into the soil at the center of every other four hills in lines one and two. Cover the briquettes with clay if the soil is not soft enough to cover placed briquettes.
- At the end of the row, get more briquettes, turn around, and place them between every other four hills between rows 3 and 4.
- At the end of the row, turn around and do the same between rows 5 and 6.
- Repeat until all rows are covered.



- Leave the field undisturbed for 30 days. You do not need to apply briquettes again for the rest of the season.
- Ensure water in the required quantity to avoid soil cracks in the briquettes-applied paddy field.

❖ For non-line-transplanted paddy

- Maintain 16-inch distance (40 cm) from one placement point to the other.
- The other procedure is the same as it is for line-transplanted paddy.



Nano-urea

Mix 2-4 ml of nano-urea in one litre of water and spray on crop leaves at active growth stages.

- First spray @ 20-25 DAT (i.e., at active tillering stage)
- Second spray 20-30 days after first spray

Note: The application of nano-urea spray is over and above the urea applied through DAP or complex fertilizer at the basal stage (i.e., 1/3rd of urea and full (100%) doses of P & K as recommended).



Table 3. Effect of foliar application of nano urea–liquid (nano N) on different crops in “on-station’ trials across India

S. No.	Location/State	Crop	Season	Yield in RDF plot (t ha ⁻¹)	Yield in 50% N and nano N (2 sprays) plot (t ha ⁻¹)
1	Annamalai, Tamil Nadu	Capsicum	Rabi 2019-20	16.30	19.21
2	Bengaluru, Karnataka	Cucumber	Rabi 2019-20	120.10	126.60
3	Telangana	Maize	Kharif/Summer 2019-20	6.63	6.75
4	Raichur, Karnataka	Maize	Kharif/Summer 2019-20	5.08	5.83
5	Raichur, Karnataka	Maize	Kharif 2020-21	4.74	4.94
6	Bengaluru, Karnataka	Maize	Kharif 2020-21	8.31	9.14
7	Shimoga, Karnataka	Paddy	Kharif/Summer 2019-20 & 2020-21	2.78	3.16
8	Jorhat, Assam	Rice	Kharif 2020-21	4.26	5.30
9	Bengaluru, Karnataka	Rice	Kharif 2020-21	5.26	5.42
10	Shimoga, Karnataka	Tomato	Kharif/Summer 2019-20	64.66	72.07
11	Rahuri, Maharashtra	Tomato	Kharif/Summer 2019-20	60.89	63.90
12	Anand, Gujarat	Wheat	Rabi 2019-20 & 2020-21	4.70	4.82
13	Ranchi, Jharkhand	Wheat	Rabi 2019-20	3.43	4.22
14	Udaipur, Rajasthan	Wheat	Rabi 2019-20	4.42	5.31
15	Jaipur, Rajasthan	Wheat	Rabi 2019-20	4.82	5.55
16	Ayodhya, Uttar Pradesh	Wheat	Rabi 2019-20	3.20	3.94

Source: Yogendra Kumar, Tarunendu Singh, Ramesh Raliya and K.N. Tiwari (2021). “Nano Fertilizers for Sustainable Crop Production, Higher Nutrient Use Efficiency and Enhanced Profitability”. Indian Journal of Fertilisers 17 (11) : 1206-1214, November, 2021.

Vegetables

Tomato

Recommended Dosage of Nutrients

Varieties	Nutrient /Fertilizer Type	Recommended Dosage (Kg)					
		Ha			Bigha		
Conventional	N: P: K	75	60	60	10	8	8
	Urea: DAP: MoP	112	130	100	15	17	13
Hybrid	N: P: K	120	200	200	16	27	27
	Urea: DAP: MoP	91	434	334	12	58	45

FDP Briquettes

While transplanting, place NPK briquettes of size 2.7 gm each at 7-10 cm (3-4 inch) deep at the root zone of the plant by handheld applicator OR self-propelled applicator OR transplanter-mounted FDP applicator, etc.



Nano-urea

Mix 2-4 ml of nano-urea in one litre of water and spray on crop leaves at active growth stages.

- First spray @ 20-25 DAT
- Second spray 10-15 days after first spray

Note: Application of basal dose is necessary as recommended (i.e., 1/3rd of urea and full doses (100%) of P & K).

S. No.	Location/State	Crop	Season	Yield in RDF plot (t ha ⁻¹)	Yield in 50% N and nano N (2 sprays) plot (t ha ⁻¹)
1	Annamalai, Tamil Nadu	Capsicum	Rabi 2019-20	16.30	19.21
2	Bengaluru, Karnataka	Cucumber	Rabi 2019-20	120.10	126.60
3	Telangana	Maize	Khariif/Summer 2019-20	6.63	6.75
4	Raichur, Karnataka	Maize	Khariif/Summer 2019-20	5.08	5.83
5	Raichur, Karnataka	Maize	Khariif 2020-21	4.74	4.94
6	Bengaluru, Karnataka	Maize	Khariif 2020-21	8.31	9.14
7	Shimoga, Karnataka	Paddy	Khariif/Summer 2019-20 & 2020-21	2.78	3.16
8	Jorhat, Assam	Rice	Khariif 2020-21	4.26	5.30
9	Bengaluru, Karnataka	Rice	Khariif 2020-21	5.26	5.42
10	Shimoga, Karnataka	Tomato	Khariif/Summer 2019-20	64.66	72.07
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Brinjal

Recommended Dosage of Nutrients

Varieties	Nutrient /Fertilizer Type	Recommended Dosage					
		Ha			Bigha		
Conventional	N: P: K	50	50	50	10	8	8
	Urea: DAP: MoP	66	108	83	9	14	11
Hybrid	N: P: K	120	100	100	16	13	13
	Urea: DAP: MoP	170	217	167	23	29	22

FDP Briquettes

At the time of transplanting, place NPK briquettes 7-10 cm (3-4 inch) deep at the root zone of the plant by handheld applicator OR self-propelled applicator OR transplanter-mounted FDP applicator, etc.

Nano-urea

Mix 2-4 ml of nano-urea in one litre of water and spray on crop leaves at active growth stages.

- First spray @ 20-25 DAT
- Second spray 10-15 days after first spray

Note: Application of basal dose is necessary as recommended (i.e., Half (50%) of urea and full (100%) doses of P & K).



Mustard

Recommended Dosage of Nutrients

Nutrient /Fertilizer Type	Recommended Dosage (Kg)					
	Ha			Bigha		
N: P: K	80	40	30	11	5	4
Urea: DAP: MoP	140	87	50	19	12	7

FDP Briquettes

While sowing mustard seeds, place NPK briquettes 7-10 cm (3-4 inch) deep in the soil along with the seed by handheld applicator OR self-propelled applicator OR transplanter-mounted FDP applicator, etc.

Nano-urea

Mix 2-4 ml of nano-urea in one litre of water and spray on crop leaves at active growth stages.

- First spray @ 20-25 DAT
- Second spray 10-20 days after first spray

Note: Application of basal dose is necessary as recommended (i.e., Half (50%) of urea and full (100%) doses of P & K).

Table 1: The effect of nano fertilizer and method of their addition on the growth and flowering of tomato, eggplant and pepper

The number of flowers per plant	The number of leaves per plant	The percentage of dry matter (%)	Stem diameter (cm)	The number of branches	The leaf area (cm ²)	Plant height (cm)	Treatments	
4.64	38.00	14.10	7.25	2.31	80.10	76.80	Control (A 1)	Tomato
5.00	34.33	14.84	7.94	2.41	96.20	77.30	Foliar spraying (A 2)	
6.41	38.33	14.58	8.39	2.50	92.30	95.30	Ground addition (A 3)	
N.S	N.S	N.S	N.S	N.S	N.S	16.00	L.S.D	0.05
4.03	17.17	12.46	6.40	2.16	97.5	33.25	Control (A 1)	Eggplant
4.70	18.72	13.02	6.75	2.86	111.20	31.53	Foliar spraying (A 2)	
4.60	20.03	11.91	6.39	2.23	131.20	37.42	Ground addition (A 3)	
N.S	N.S	N.S	N.S	N.S	28.40	1.44	L.S.D	0.05
8.78	55.70	12.08	7.43	2.66	39.50	39.67	Control (A 1)	Pepper
12.20	55.70	12.20	8.10	3.19	44.50	40.33	Foliar spraying (A 2)	
9.96	56.70	12.33	8.22	2.80	45.00	42.94	Ground addition (A 3)	
3.10	N.S	N.S	0.35	0.24	N.S	1.54	L.S.D	0.05

Source: Kadhim Fadhil, Hakim Rabab, Mijwel Abbas. (2021) 55-58. "Response of tomato, eggplant, and pepper to nano-fertilizers and the method of their addition"
