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The names and affiliations of all authors are provided below, following the references.

Effect of press mud compost on soil properties, nutrient uptake and yield of maize in Inceptisol 1M K Potkule, 2S R Shelke, 3B M Kamble, 4A G Durgude, 5R S Thakare, 6M R Patil, 7S S Gholave

Mayur K Potkule¹, SR Shelke², BM Kamble³, AG Durgude⁴, RS Thakare⁵, MR Patil⁶, SS Gholave⁷

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ABSTRACT

A field experiment was conducted during Kharif 2024-25 at the Post Graduate Instructional Research Farm, MPKV, Rahuri, to evaluate the effect of press mud compost (PMC) on soil properties, nutrient uptake, yield and microbial population of maize grown in Inceptisol. The experiment was laid out in Randomized Block Design with eight treatments and three replications, comprising graded levels of RDF (100%, 75%, 50%) combined with PMC (5 and 7.5 t ha⁻¹), along with absolute control and GRDF + FYM treatments. The initial soil was moderately alkaline, medium in organic carbon, available N and P, and very high in available K. Application of 100% RDF + 7.5 t PMC ha⁻¹ (T₄) recorded significantly superior plant growth (height and leaves plant⁻¹), grain yield (70.90 q ha⁻¹) and stover yield (119.40 q ha⁻¹), on par with GRDF + 10 t FYM ha⁻¹ (T₂). The same treatment recorded the highest uptake of N, P, K and micronutrients (Fe, Mn, Zn, Cu). Post-harvest soil analysis revealed no significant change in pH, EC and CaCO₃, but organic carbon, available N, P, K and DTPA-extractable micronutrients were significantly enhanced under T₄, along with the highest population of bacteria, fungi and actinomycetes. Economic analysis, however, indicated that 100% RDF + 5 t PMC ha⁻¹ (T₃) gave the highest net returns (₹76,635 ha⁻¹) and B:C ratio (2.11), owing to the lower cost of PMC application compared to T₄. The results suggest that integrated application of RDF with PMC improves soil fertility, microbial activity, nutrient uptake and maize productivity, with T₄ being agronomically superior and T₃ being the most economically viable option for sustainable maize production in Inceptisols.

Keywords: Press mud compost, Inceptisol, Maize, Nutrient uptake, Soil fertility, Microbial population, Economics

Introduction

Maize (*Zea mays* L.), often referred to as the 'queen of cereals,' is one of the most important cereal crops globally owing to its high genetic yield potential and efficient C4 photosynthetic pathway. It serves as a major source of dietary energy, protein, oil and micronutrients for humans, poultry and livestock. In India, maize occupies a critical position in ensuring food, feed and industrial security. As per the Directorate of Economics and Statistics, the area, production and productivity of maize increased from 9.89 million ha, 31.65 million tonnes and 3,199 kg ha⁻¹ during 2020-21 to 12.09 million ha, 43.41 million tonnes and 3,590 kg ha⁻¹ during 2024-25 (DA&FW, 2023; DA&FW, 2025) [1, 2], reflecting the crop's growing importance and the need for improved nutrient management strategies.

A large share of intensive maize cultivation in Maharashtra is carried out on Inceptisols, which are characterized by weak pedogenic development, low organic carbon reserves, susceptibility to compaction and limited macronutrient availability. Continuous cultivation of nutrient-exhaustive crops like maize, coupled with excessive reliance on inorganic fertilizers, has been associated with declining fertilizer-use efficiency and deterioration of soil physical and biological properties (Basel *et al.*, 2014; Bayu *et al.*, 2006) [3, 4]. Integration of organic amendments such as press mud compost, a nutrient-rich byproduct of the sugarcane processing industry, is therefore essential for sustaining soil health. Composted press mud improves soil physical properties such as porosity and water-holding capacity (Ghulam *et al.*, 2010; Rangaraj *et al.*, 2007) [5, 6], lowers pH in alkaline soils through organic acid release (Dang *et al.*, 1996) [7], and stimulates beneficial microbial populations that enhance nutrient mineralization and availability (Yang *et al.*, 2013; Budiyo, 2021) [9, 8]. With 200 sugar factories operating in Maharashtra during 2024-25 (Sugar Commissionerate *et al.*, 2025) [10], recycling press mud through composting is both agronomically and environmentally relevant.

Given maize's high nutrient demand and the demonstrated agronomic potential of press mud compost over other organic manures in earlier studies (Prasad *et al.*, 2020) [11], the present investigation was undertaken to evaluate the effect of press mud compost, applied at varying rates with graded levels of recommended fertil

Corresponding Author:
Mayur K Potkule
 Department of Soil Science,
 Post Graduate Institute,
 MPKV Rahuri,
 Maharashtra, India

izer dose, on soil properties, nutrient uptake and yield of maize grown in an Inceptisol, with the objectives to study the effect of press mud compost on soil properties after harvest of maize and to study the effect of press mud compost on nutrient uptake and yield of maize.

Materials and Methods

A field experiment was conducted during Kharif 2024–25 at the Post Graduate Institute Research Farm, Department of Soil Science, MPKV, Rahuri, Maharashtra (19°47'–19°57' N, 74°19'–74°32' E; 495 m amsl), situated in the semi-arid tropical zone. The experimental soil (Inceptisol, clayey texture) was moderately alkaline (pH 8.29), normal in EC (0.26 dS m⁻¹), medium in organic carbon (0.58%) and calcium carbonate (7.29%), medium in available N (254.27 kg ha⁻¹) and P (18.40 kg ha⁻¹), very high in available K (417 kg ha⁻¹), and sufficient in DTPA-Fe, Mn, Zn and Cu (4.91, 8.32, 0.68 and 1.26 mg kg⁻¹, respectively). The press mud compost (PMC) used contained pH 7.24, EC 2.15 dS m⁻¹, organic carbon 28.40%, total N 1.68%, P 1.21%, K 0.92% and C:N ratio 16.9:1.

The experiment was laid out in a Randomized Block Design with eight treatments and three replications using maize hybrid Advanta 756 (spacing 75 × 20 cm). Treatments comprised: T₁ – Absolute control; T₂ – GRDF (120:60:40 kg N:P₂O₅:K₂O ha⁻¹) + FYM @ 10 t ha⁻¹; T₃ – 100% RDF + PMC @ 5 t ha⁻¹; T₄ – 100% RDF + PMC @ 7.5 t ha⁻¹; T₅ – 75% RDF + PMC @ 5 t ha⁻¹; T₆ – 75% RDF + PMC @ 7.5 t ha⁻¹; T₇ – 50% RDF + PMC @ 5 t ha⁻¹; T₈ – 50% RDF + PMC @ 7.5 t ha⁻¹. Fertilizers (urea, SSP, MOP) were applied with half N and full P, K as basal dose, and remaining N top-dressed in two splits at knee-high and tasseling stages. PMC was incorporated ~15 days before sowing. Other agronomic practices were kept uniform across treatments.

Plant height and leaves plant⁻¹ were recorded at harvest from tagged plants, while grain and stover yields (q ha⁻¹) were recorded from the net plot. Composite soil samples (0–15 cm) collected before sowing and after harvest were analyzed for pH and EC (1:2.5 suspension; Jackson, 1973) [12], organic carbon (Walkley *et al.*, 1934) [13], available N (Subbiah *et al.*, 1956) [14], available P (Olsen *et al.*, 1954) [15], available K (Jackson, 1973) [12], DTPA-Fe, Mn, Zn, Cu (Lindsay *et al.*, 1978) [16], CaCO₃ (Jackson, 1973) [12] and bulk density (Blake *et al.*, 1986) [17]. Grain and stover samples were analyzed for N (micro-Kjeldahl), P (vanado-molybdate method) and K (flame photometry) content (Jackson, 1973) [12] to compute nutrient uptake. Soil bacterial, fungal and actinomycete populations were enumerated by the serial dilution plate technique (Dhingra *et al.*, 1995) [18]. Data were statistically analyzed by ANOVA for Randomized Block Design (Panse and Sukhatme, 1954).

Results and Discussion

1. Effect of press mud compost on soil properties after harvest of maize

Physical properties: Sand (28.90–28.93%), silt (21.02–21.10%) and clay (50.00–50.16%) content of soil after harvest did not differ significantly among treatments, as soil texture is a stable property unlikely to change within a single cropping season. Bulk density, however, showed a favourable numerical decline from 1.32 Mg m⁻³ (initial) to 1.29 Mg m⁻³ under T₂ and T₆, against 1.32 Mg m⁻³ in the absolute control (T₁), reflecting improved soil aggregation and pore space due to organic matter addition through PMC, consistent with Tompe *et al.* (1997) [19] and Chattha *et al.* (2019) [20].

Chemical properties: Soil pH (8.13–8.31) and EC (0.26–0.32 dS m⁻¹) after harvest were not significantly affected by treatments, indicating that PMC application neither increased alkalinity nor caused harmful salt accumulation over one season. In contrast, organic carbon was significantly influenced, increasing from an initial 0.58% to a maximum of 0.63% under T₄ (100% RDF + 7.5 t PMC ha⁻¹), statistically at par with T₂ (0.61%), against a decline to 0.52% under the control — attributable to the 28.40% organic carbon content of the PMC and

its gradual mineralization (Tompe *et al.*, 1997; Rangaraj *et al.*, 2007) [19, 6]. Calcium carbonate content (7.26–7.32%) remained statistically unaffected, confirming that PMC did not disturb the carbonate equilibrium of this calcareous Inceptisol.

Available macronutrients: Available N, P and K in soil after harvest were significantly enhanced by PMC application. The highest available N (309.33 kg ha⁻¹), P (31.94 kg ha⁻¹) and K (473.67 kg ha⁻¹) were recorded under T₄, statistically at par with T₂ (308.33, 31.84 and 472.84 kg ha⁻¹, respectively), against initial values of 254.27, 18.40 and 417.00 kg ha⁻¹. The lowest values were recorded under the absolute control (227.00, 18.33 and 383.00 kg ha⁻¹). This improvement is attributed to direct nutrient contribution from PMC, mineralization of organic nitrogen, reduced phosphorus fixation through organic acid release, and enhanced potassium cycling via improved cation exchange, in agreement with Rangaraj *et al.* (2007) [6], More (1994) [21], Bayu *et al.* (2006) [4] and Khan *et al.* (2012) [22].

DTPA-extractable micronutrients: PMC application significantly increased DTPA-extractable Fe (4.21–5.91 mg kg⁻¹), Mn (7.21–9.80 mg kg⁻¹), Zn (0.70–1.07 mg kg⁻¹) and Cu (1.13–1.54 mg kg⁻¹) in soil, with T₄ recording the highest values for all four micronutrients, statistically at par with T₂ for Fe and Mn. This enhancement reflects the direct micronutrient contribution of PMC (826, 22, 75 and 53 mg kg⁻¹ of Fe, Mn, Zn and Cu, respectively) and organic-matter-mediated improvement in micronutrient retention, supporting Khan *et al.* (2012) [22] and Sardar *et al.* (2012) [23].

Soil microbial population: Bacterial (22.80–37.70 × 10⁶ cfu g⁻¹), fungal (12.23–18.90 × 10⁴ cfu g⁻¹) and actinomycete (15.00–26.90 × 10⁴ cfu g⁻¹) populations were significantly higher under PMC treatments, with T₄ recording the maximum count for all three groups, statistically at par with T₂. The increase reflects the readily decomposable organic carbon and nutrient substrate supplied by PMC, which stimulated microbial proliferation, consistent with Tompe *et al.* (1997) [19] and Yang *et al.* (2013) [9].

2. Effect of press mud compost on nutrient uptake and yield of maize

Grain and stover yield: Grain yield (43.20–70.90 q ha⁻¹) and stover yield (79.20–119.40 q ha⁻¹) were significantly influenced by PMC application. T₄ recorded the highest grain (70.90 q ha⁻¹) and stover yield (119.40 q ha⁻¹), statistically at par with T₂ for grain yield (69.97 q ha⁻¹) but significantly superior to T₂ for stover yield (117.83 q ha⁻¹). The lowest yields were recorded under the absolute control. This improvement reflects better vegetative growth, greater nutrient uptake and enhanced assimilate accumulation under integrated nutrient supply, in agreement with Muhammad *et al.*, (2009) [24], Manimaran *et al.* (2019) [25], Budiyo (2020) [26] and Bashir *et al.* (2021) [27].

Macronutrient uptake: Total N, P and K uptake by maize were significantly higher under PMC-amended treatments. T₄ recorded the maximum uptake of N (172.20 kg ha⁻¹), P (42.70 kg ha⁻¹) and K (164.40 kg ha⁻¹), statistically at par with T₂ (171.94, 42.63 and 163.87 kg ha⁻¹, respectively), while the lowest uptake was recorded under the control. This is attributed to the combined and complementary nutrient supply from RDF and PMC (containing 1.66% N, 1.21% P and 0.92% K), which promoted greater biomass production and nutrient absorption, corroborating Muhammad *et al.*, (2009) [24], Ghulam *et al.* (2012) and Manimaran *et al.* (2019) [25]. Notably, within each RDF level, increasing PMC from 5 to 7.5 t ha⁻¹ consistently improved nutrient uptake (e.g., K uptake rose from 127.41 to 137.57 kg ha⁻¹ at 75% RDF), indicating a dose-dependent contribution of PMC even under reduced fertilizer levels.

Micronutrient uptake: Total uptake of Fe (930–1510 g ha⁻¹), Mn (501–689 g ha⁻¹), Zn (91.50–97.27 g ha⁻¹) and Cu (80.00–128.00 g ha⁻¹) was significantly highest under T₄, generally at par with T₂, reflecting the additional micronutrient supply from PMC coupled with greater biomass production and improved root proliferation under integrated nutrient management (Khan *et al.*, 2012; Sardar *et al.*, 2012) [22, 23].

Overall, the results indicate that integration of 100% RDF with 7.5 t PMC ha⁻¹ (T₄) was most effective in enhancing post-harvest soil fertility, biological activity, nutrient uptake and yield of maize, primarily

through the combined mineral and organic nutrient supply, improved soil organic carbon status and stimulated microbial activity.

Table 1. Effect of press mud compost and inorganic fertilizers on chemical properties of soil after harvest of maize

Tret. No.	Treatment Details	Chemical Properties of Soil			
		pH (1:2.5)	EC (dS m ⁻¹)	Org. C (%)	CaCO ₃ (%)
T ₁	Absolute control	8.23	0.26	0.52	7.29
T ₂	GRDF (120:60:40 N:P ₂ O ₅ :K ₂ O ha ⁻¹ + 10 t ha ⁻¹ FYM)	8.13	0.30	0.62	7.26
T ₃	100% RDF + 5 t ha ⁻¹ press mud compost	8.22	0.31	0.61	7.30
T ₄	100% RDF + 7.5 t ha ⁻¹ press mud compost	8.16	0.32	0.63	7.28
T ₅	75% RDF + 5 t ha ⁻¹ press mud compost	8.15	0.30	0.59	7.31
T ₆	75% RDF + 7.5 t ha ⁻¹ press mud compost	8.18	0.29	0.60	7.29
T ₇	50% RDF + 5 t ha ⁻¹ press mud compost	8.24	0.26	0.56	7.32
T ₈	50% RDF + 7.5 t ha ⁻¹ press mud compost	8.31	0.28	0.57	7.29
	SE (m) ±	0.18	0.08	0.01	0.02
	CD at 5%	NS	NS	0.04	NS
	Initial	8.29	0.26	0.58	7.29

Table 2. Effect of press mud compost and inorganic fertilizers on available macronutrients and DTPA-extractable micronutrients in soil after harvest of maize.

Tret. No.	Treatment Details	Available macronutrients (kg ha ⁻¹)			DTPA Micronutrients (mg kg ⁻¹)			
		N	P	K	Fe	Mn	Zn	Cu
T ₁	Absolute control	227.00	18.33	383.00	4.21	7.21	0.70	1.13
T ₂	GRDF (120:60:40 N:P ₂ O ₅ :K ₂ O ha ⁻¹ + 10 t ha ⁻¹ FYM)	308.33	31.84	472.84	5.91	9.61	1.02	1.50
T ₃	100% RDF + 5 t ha ⁻¹ press mud compost	283.00	28.97	439.00	5.30	8.85	0.97	1.37
T ₄	100% RDF + 7.5 t ha ⁻¹ press mud compost	309.33	31.94	473.67	5.91	9.80	1.07	1.54
T ₅	75% RDF + 5 t ha ⁻¹ press mud compost	266.00	26.37	421.00	4.90	8.37	0.90	1.30
T ₆	75% RDF + 7.5 t ha ⁻¹ press mud compost	275.00	27.58	429.00	5.10	8.62	0.95	1.33
T ₇	50% RDF + 5 t ha ⁻¹ press mud compost	245.00	21.97	397.00	4.55	7.81	0.81	1.21
T ₈	50% RDF + 7.5 t ha ⁻¹ press mud compost	256.00	24.14	411.00	4.75	8.05	0.86	1.25
	SE (m) ±	0.42	0.19	0.25	0.01	0.08	0.03	0.03
	CD at 5%	1.30	0.60	0.76	0.04	0.24	0.11	0.10
	Initial	254.27	18.40	417.00	4.91	8.32	0.68	1.26

Table 3. Effect of press mud compost and inorganic fertilizers on soil microbial population after harvest of maize

Tret. No.	Treatment Details	Soil Microbial Population		
		Total Bacterial (cfu × 10 ⁶ g ⁻¹)	Total Fungi (cfu × 10 ⁴ g ⁻¹)	Total Actinomycetes (cfu × 10 ⁴ g ⁻¹)
T ₁	Absolute control	22.80	12.23	15.00
T ₂	GRDF (120:60:40 N:P ₂ O ₅ :K ₂ O ha ⁻¹ + 10 t ha ⁻¹ FYM)	37.53	18.54	26.63
T ₃	100% RDF + 5 t ha ⁻¹ press mud compost	33.10	16.30	23.30
T ₄	100% RDF + 7.5 t ha ⁻¹ press mud compost	37.70	18.90	26.90
T ₅	75% RDF + 5 t ha ⁻¹ press mud compost	29.90	14.70	21.10

(continued on next page)

Tret. No.	Treatment Details	Soil Microbial Population		
		Total Bacterial (cfu $\times 10^6$ g $^{-1}$)	Total Fungi (cfu $\times 10^4$ g $^{-1}$)	Total Actinomycetes (cfu $\times 10^4$ g $^{-1}$)
T ₆	75% RDF + 7.5 t ha $^{-1}$ press mud compost	31.31	15.50	22.30
T ₇	50% RDF + 5 t ha $^{-1}$ press mud compost	27.10	13.00	18.70
T ₈	50% RDF + 7.5 t ha $^{-1}$ press mud compost	28.86	13.70	19.90
	SE (m) $\pm$	0.06	0.13	0.11
	CD at 5%	0.19	0.39	0.34
	Initial	21.47	11.00	14.30

Table 4. Effect of press mud compost on grain and stover yield of maize

Tret. No.	Treatment Details	Yield (q ha $^{-1}$)	
		Grain	Stover
T ₁	Absolute control	43.20	79.20
T ₂	GRDF (120:60:40 N:P ₂ O ₅ :K ₂ O ha $^{-1}$ + 10 t ha $^{-1}$ FYM)	69.97	117.83
T ₃	100% RDF + 5 t ha $^{-1}$ press mud compost	68.90	114.27
T ₄	100% RDF + 7.5 t ha $^{-1}$ press mud compost	70.90	119.40
T ₅	75% RDF + 5 t ha $^{-1}$ press mud compost	65.55	95.37
T ₆	75% RDF + 7.5 t ha $^{-1}$ press mud compost	66.10	96.27
T ₇	50% RDF + 5 t ha $^{-1}$ press mud compost	57.20	90.50
T ₈	50% RDF + 7.5 t ha $^{-1}$ press mud compost	59.20	93.17
	SE (m) $\pm$	0.32	0.35
	CD at 5%	0.99	1.07

Table 5. Effect of press mud compost on total N, P, K and total micronutrient uptake by maize

Tret. No.	Treatment Details	Total nutrient uptake (kg ha $^{-1}$)			Total micronutrients uptake (g ha $^{-1}$)			
		Nitrogen	Phosphorus	Potassium	Fe	Mn	Zn	Cu
T ₁	Absolute control	102.07	23.10	97.60	930	501	91	80
T ₂	GRDF (120:60:40 N:P ₂ O ₅ :K ₂ O ha $^{-1}$ + 10 t ha $^{-1}$ FYM)	171.94	42.63	163.87	1472	684	97	122.33
T ₃	100% RDF + 5 t ha $^{-1}$ press mud compost	153.40	37.50	148.00	1448	628	96.99	112.67
T ₄	100% RDF + 7.5 t ha $^{-1}$ press mud compost	172.20	42.70	164.40	1510	689	97.27	128
T ₅	75% RDF + 5 t ha $^{-1}$ press mud compost	133.37	31.73	127.41	1262	590	93.77	102
T ₆	75% RDF + 7.5 t ha $^{-1}$ press mud compost	143.60	34.53	137.57	1387	635	94.28	116
T ₇	50% RDF + 5 t ha $^{-1}$ press mud compost	113.57	25.51	109.63	1142	558	92.31	94
T ₈	50% RDF + 7.5 t ha $^{-1}$ press mud compost	123.53	28.77	119.53	1208	600	93.26	106
	SE (m) $\pm$	0.11	0.21	0.17	0.79	1.08	0.01	1.03
	CD at 5%	0.35	0.65	0.54	2.39	3.27	0.03	3.15

Conclusion

The results of the present investigation revealed that integrated application of press mud compost (PMC) with recommended fertilizer dose significantly improved soil fertility, nutrient uptake and productivity of maize grown in Inceptisol. Application of 100% RDF (120:60:40 kg N:P₂O₅:K₂O ha $^{-1}$) along with 7.5 t PMC ha $^{-1}$ (T₄) recorded the highest grain and stover yield, maximum uptake of macro- and micronutrients, and enhanced post-harvest availability of soil N, P, K and DTPA-extractable Fe, Mn, Zn and Cu, without adversely affecting soil pH, EC or CaCO₃ status. However, on the basis

of economic returns, 100% RDF + 5 t PMC ha $^{-1}$ (T₃) proved more remunerative, recording the highest net returns and B:C ratio. Thus, for maximizing maize productivity and soil fertility, 100% RDF + 7.5 t PMC ha $^{-1}$ is recommended, while 100% RDF + 5 t PMC ha $^{-1}$ offers a more economical alternative for resource-constrained farmers, under similar Inceptisol conditions.

References

1. Department of Agriculture and Farmers Welfare. Agricultural Statistics at a Glance 2023. Economics, Statistics and Evaluation Division, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi. 2023.

2. Department of Agriculture and Farmers Welfare. Agricultural Statistics at a Glance 2024–25. Economics, Statistics and Evaluation Division, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi. 2025.
3. Basel N, Sami M. Effect of organic and inorganic fertilizers application on soil and cucumber (*Cucumis sativa* L.) plant productivity. *International Journal of Agriculture and Forestry*. 2014;4(3):166–170.
4. Bayu W, Rethman NFG, Hammes PS, Alemu G. Effects of farmyard manure and inorganic fertilizers on soil fertility and maize productivity. *Journal of Agronomy*. 2006;5(3):525–531.
5. Ghulam S, Muhammad J, Khan UK, Rehman HU. Impact of press mud as organic amendment on physio-chemical characteristics of calcareous soil. *Sarhad Journal of Agriculture*. 2010;26(4):565–570.
6. Rangaraj T, Somasundaram E, Amanullah MM, Thirumurugan V, Ramesh S, Ravi S. Effect of agro-industrial wastes on soil properties and yield of irrigated finger millet (*Eleusine coracana* L. Gaertn) in coastal soil. *Journal of Agriculture and Biological Sciences*. 2007;3(3):153–156.
7. Dang YP, Verma KS. Direct and residual effect of press mud cakes in rice–wheat cropping system. *Journal of the Indian Society of Soil Science*. 1996;44(3):448–450.
8. Budiyo G. Sugarcane press mud compost improves fertility and productivity of coastal sandy soil. *Journal of Degraded and Mining Lands Management*. 2021;8(4):2901–2910.
9. Yang SD, Liu JX, Wu J, Tan HW, Li YR. Effects of vinasse and press mud application on the biological properties of soils and productivity of sugarcane. *Sugar Tech*. 2013;15(2):152–158.
10. Sugar Commissionerate, Maharashtra State. Sugar Industry in Maharashtra. Department of Co-operation, Marketing and Textiles, Government of Maharashtra, Pune, Maharashtra. 2025.
11. Prasad G, Kumar P, Rinwa RS, Singh AK, Sharma KD. Effect of nutrient sources on spring maize (*Zea mays*) and its residual effect on succeeding basmati rice (*Oryza sativa*). *The Indian Journal of Agricultural Sciences*. 2020;90(9):1690–1694.
12. Jackson ML. Soil Chemical Analysis. Prentice-Hall of India Private Limited, New Delhi. 1973.
13. Walkley A, Black IA. An examination of the Degtjareff method for determining soil organic matter and a proposed modification of the chromic acid titration method. *Soil Science*. 1934;37(1):29–38.
14. Subbiah BV, Asija GL. A rapid procedure for the estimation of available nitrogen in soils. *Current Science*. 1956;25(8):259–260.
15. Olsen SR, Cole CV, Watanabe FS, Dean LA. Estimation of available phosphorus in soils by extraction with sodium bicarbonate (USDA Circular No. 939). United States Department of Agriculture. 1954.
16. Lindsay WL, Norvell WA. Development of a DTPA soil test for zinc, iron, manganese and copper. *Soil Science Society of America Journal*. 1978;42(3):421–428.
17. Blake GR, Hartge KH. Bulk density. In A. Klute (Ed.), *Methods of Soil Analysis. Part 1: Physical and Mineralogical Methods* (2nd Ed., Agronomy Monograph No. 9, pp. 363–375). American Society of Agronomy and Soil Science Society of America. 1986.
18. Dhingra OD, Sinclair JB. *Basic plant pathology methods* (2nd Ed.). CRC Press. 1995.
19. Tompe AD, More SD. Effect of press mud cake on soil physical, chemical and biological properties of Vertisols. *Journal of Maharashtra Agricultural Universities*. 1997;22(1):45–49.
20. Chattha MU, Hassan MU, Barbanti L, Chattha MB, Khan I, Usman M, Ali A, Nawaz M. *Composted sugarcane by-product press mud cake supports wheat growth and improves soil properties*. *International Journal of Plant Production*. 2019;13(3):241–249.
21. More SD. Effect of farm wastes and organic manures on soil properties, nutrient availability and yield of rice-wheat grown on sodic Vertisol. *Journal of the Indian Society of Soil Science*. 1994;42(2):253–256.
22. Khan MJ, Khattak RA, Muhammad D. Press mud as an organic amendment for improving soil fertility and crop productivity. *Sarhad Journal of Agriculture*. 2012;28(4):641–648.
23. Sardar S, Ilyas SU, Malik SR, Javaid K. Compost fertilizer production from sugar press mud (SPM). *International Journal of Chemical and Environmental Engineering*. 2012;3(1):39–43.
24. Muhammad D, Khattak RA. Growth and nutrient uptake of maize as affected by press mud under saline-sodic soil conditions. *Soil and Environment*. 2009;28(2):145–155.
25. Manimaran S, Saravanan M, Sudhakar P, Bardhan G, Suresh Kumar SM. Studies on influence of activated EM enriched composts on productivity enhancement in hybrid maize (*Zea mays* L.). *Plant Archives*. 2019;19(1):314–317.
26. Budiyo G. The effect of combination of sugarcane press mud compost and potassium fertilizer on vegetative growth of corn in coastal sandy soil. *Food Research*. 2020;5(3):289–296.
27. Bashir S, Hussain Q, Akmal M, Riaz M, Ijaz SS, Iqbal M. Effect of sugarcane press mud on soil properties, nutrient uptake and maize productivity under calcareous soil. *Journal of Soil Science and Plant Nutrition*. 2021;21(2):1129–1142.
28. Ghulam M, Khattak RA. Effect of press mud cake on soil chemical properties under calcareous soils. *Sarhad Journal of Agriculture*. 2010;26(4):565–570.
29. Panse VG, Sukhatme PV. *Statistical methods for agricultural workers*. Indian Council of Agricultural Research, New Delhi. 1985.

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Authors

Mayur K Potkule

Department of Soil Science, Post Graduate Institute, MPKV Rahuri, Maharashtra, India

SR Shelke

Department of Soil Science, Post Graduate Institute, MPKV Rahuri, Maharashtra, India

BM Kamble

Department of Soil Science, Post Graduate Institute, MPKV Rahuri, Maharashtra, India

AG Durgude

AICRP on Irrigation Water Management, Post Graduate Institute, MPKV Rahuri, Maharashtra, India

RS Thakare

Department of Soil Science, Post Graduate Institute, MPKV Rahuri, Maharashtra, India

MR Patil

Department of Agricultural Statistics, Post Graduate Institute, MPKV Rahuri, Maharashtra, India

SS Gholave

Department of Horticulture, Post Graduate Institute, MPKV Rahuri, Maharashtra, India