



ISSN (E): 2277-7695

ISSN (P): 2349-8242

NAAS Rating: 5.23

TPI 2023; SP-12(8): 17-18

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www.thepharmajournal.com

Received: 15-05-2023

Accepted: 28-06-2023

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To evaluate STCR based nutrient requirement to achieve targeted yield of maize in a *Vertisol* of Chhattisgarh

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Abstract

At STCR Farm, IGKV Raipur (C.G.), during the *Kharif* season of 2021 and 2022, field experiments were done to investigate the nutrient requirements for targeted production of maize in a *Vertisol* of the Chhattisgarh plain. The treatments included various combinations of N (0, 60, 120, 180 kg ha⁻¹), P (0, 30, 60, 90 kg ha⁻¹), and K (0, 30, 60, 90 kg ha⁻¹), each at 4 levels. All of the strips had three levels of organic source (FYM) overlaid on them (0, 5, and 10 t ha⁻¹). 1.62 kg of N, 0.33 kg of P₂O₅, and 2.09 kg of K₂O were needed to create one quintal of yield of maize in order to meet the yield target.

Keywords: Nutrient requirement, Targeted yield

Introduction

The aim of this experiment was to maximize the production of maize with the help of STCR based nutrient requirement and fertilizer recommendation. Maize is rich source of glucose protein and other nutritional value. After rice maize production is high in Chhattisgarh. Therefore focus on maize cultivation to achieve maximum yield through know the nutrient rent.

Materials and Methods

Nutrient Requirement (NR)

$$a) \text{ Kg N required per quintal grain production} = \frac{\text{Uptake of N (kg/ha.)from grain+straw}}{\text{Green cob yield (q/ha.)}}$$

$$b) \text{ Kg P required per quintal grain production} = \frac{\text{Uptake of P}_{205} \text{ (kg/ha.)from grain+straw}}{\text{Green cob yield (q/ha.)}}$$

$$c) \text{ Kg K required per quintal grain production} = \frac{\text{Uptake of K}_{20} \text{ (kg/ha.)from grain+straw}}{\text{Green cob yield (q/ha.)}}$$

Results and Discussion

$$Y = b_1 U \text{ or } U = 1/b_1 * Y$$

Where, 1/b₁ gives the NR (Nutrient Requirement)

Table 1: Relation of Maize yield (Y) with total nutrient uptake (U)

Nutrient	2021	2022		
	Y=b1 U	R ²	Y=b1 U	R ²
N	1.62	0.95	1.62	0.94
P	3.17	0.90	3.04	0.89
K	0.49	0.93	0.51	0.92

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Nutrient requirement of N, P and K for Maize

According to the results in (Table 2), 1.62 kg of N, 0.33 kg of P₂O₅, and 2.09 kg of K₂O were needed to generate one quintal of maize. K₂O was needed the most out of the three nutrients, followed by N and P₂O₅. The demand for K₂O was 30 times greater than that for N and 409 times greater than that for P₂O₅. According to Singh *et al.* (2015)^[1], 19.4 kilogramme of N, 5.70 kg of P₂O₅, and 18.4 kg of K₂O are needed to produce 1 t of maize grain. According to Xalxo *et al.* (2018)^[3], 1.59 kg N, 0.32 kg P, and 1.84 kg K are needed to produce 1 q of maize grain. 1.76 kg of N and 0.58 kg have been reported by Sivaranjani *et al.* (2018)^[2].

Table 2: Nutrient requirements, for Maize.

Nutrient	Nutrient requirement for one quintal grain yield of Maize (kg/q)		
	2021	2022	Mean
N	1.63	1.62	1.62
P	0.32	0.33	0.33
K	2.11	2.08	2.09

Conclusion

The present investigation of experimental outcomes showed that the maize is a indicator plant for potassium and result indicate that the requirement of potassium was higher than nitrogen and phosphorus. Balance fertilizer application is suitable to achieve maximum for maize production.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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