



Theme 1 Status and trends of global soil nutrient budget



Enhanced yield and quality in chilli with calcium, magnesium and boron nutrition

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INTRODUCTION

Chilli (*Capsicum annuum* L.) is a highly valuable crop and cultivated all over the world. It is known as universal spice of India and is well known for its pungent flavor. In Kerala, chilli is one of the important crop in majority of homesteads. Nutrient management in chilli is very important for enhancing yield and quality. Secondary and micronutrients are highly essential for crop growth because they are involved in several physiological and biochemical processes in plants. Nutrient deficiency was severe in Kerala soil due to high rainfall and soil acidity. About 60% of soils were deficient in Ca and 75% soils were deficient in Mg. Boron deficiency accounts around 40% in soil (Rajasekharan *et al.*, 2014). Chilli being an important vegetable crop which is cultivated throughout Kerala, present study is carried out with an objective to develop nutrient management practices for mitigating calcium, magnesium and boron deficiencies in chilli.

METHODOLOGY

Field experiment was carried out at Instructional farm, Nileswar, Kasaragod during the period from December to May 2021 using chilli as a test crop the variety used was Anugraha. The experiment was done in randomized block design with ten treatments and three replications. Geographically, the experiment site was located at 12°14'44" N latitude and 75°8'6" E longitude and at an altitude of 5-8m above mean sea level. Treatment combinations were T₁(KAU POP + lime (based on soil test)), T₂ (T₁ + 125 kg gypsum per hectare), T₃ (T₁ + 80 kg magnesium sulphate per hectare), T₄ (T₁ + 125 kg gypsum per hectare + 80 kg magnesium sulphate per hectare), T₅ (T₁ + foliar application of borax (0.2%)), T₆ (T₂ + foliar application of borax (0.2%)), T₇ (T₃ + foliar application of borax (0.2%)), T₈ (T₄ + foliar

application of borax (0.2%)), T₉ (KAU POP + dolomite (based on soil test)) and T₁₀ (T₉ + foliar application of borax (0.2%)). Yield parameters like average fruit weight and total fruit yield was analysed and quality attributes like capsaicin, oleoresin, ascorbic acid and shelf life was analysed.



Fig 1. Fruits from the best treatments

RESULTS

An initial soil analysis was carried out and the soil of the experimental site was sandy loam having pH 5.08 and electrical conductivity 0.14 dS m⁻¹.

The results obtained from the analysis is illustrated in the table 1 and 2.

Maximum fruit weight (7.43g), total fruit yield (4456.79 kg/ha), highest capsaicin (0.352 %), oleoresin (11.00 %), ascorbic acid content (96.83 mg/ 100 g) and maximum shelf life (13.67 days) was recorded with combined application of gypsum, MgSO₄ and borax along with KAU POP recommendation and lime (T₈).

Table 1. Effect of treatments on average fruit weight and total fruit yield

	Average fruit weight (g)	Total fruit yield (kg ha ⁻¹)
T ₁	5.60 ^d	2659.259 ^d
T ₂	6.22 ^{cd}	2864.198 ^{cd}
T ₃	6.69 ^{bc}	2703.704 ^d
T ₄	6.45 ^c	2882.305 ^{cd}
T ₅	6.48 ^c	3459.259 ^{bc}
T ₆	6.45 ^c	3546.502 ^{bc}
T ₇	6.62 ^{bc}	3718.443 ^b
T ₈	7.43 ^a	4456.790 ^a
T ₉	6.50 ^{bc}	2948.148 ^{cd}
T ₁₀	7.22 ^{ab}	3420.576 ^{bc}
CD	0.733	703.909
SE(m)	0.247	235.093

Table 2 : Effect of treatment on quality parameters

	Capsaicin (%)	Oleoresin (%)	Ascorbic acid (mg/100g)	Shelf life
T ₁	0.210 ^e	6.26 ^c	61.07 ^d	8.67 ^f
T ₂	0.317 ^b	8.73 ^{ab}	77.73 ^{bcd}	12.33 ^{bc}
T ₃	0.318 ^b	8.13 ^{bc}	66.63 ^{cd}	9.67 ^{ef}
T ₄	0.345 ^a	10.50 ^a	80.53 ^{abc}	10.67 ^{de}
T ₅	0.249 ^d	6.93 ^{bc}	83.27 ^{abc}	12.67 ^{ab}
T ₆	0.310 ^{bc}	9.00 ^{ab}	94.03 ^{ab}	13.33 ^{ab}
T ₇	0.292 ^c	7.30 ^{bc}	80.53 ^{abc}	12.67 ^{ab}
T ₈	0.352 ^a	11.00 ^a	96.83 ^a	13.67 ^a
T ₉	0.261 ^d	7.00 ^{bc}	77.73 ^{bcd}	11.33 ^{cd}
T ₁₀	0.316 ^b	7.23 ^{bc}	91.63 ^{ab}	13.33 ^{ab}
CD (0.05)	0.022	2.317	18.719	1.073
SE(m)	0.007	0.774	6.252	0.358

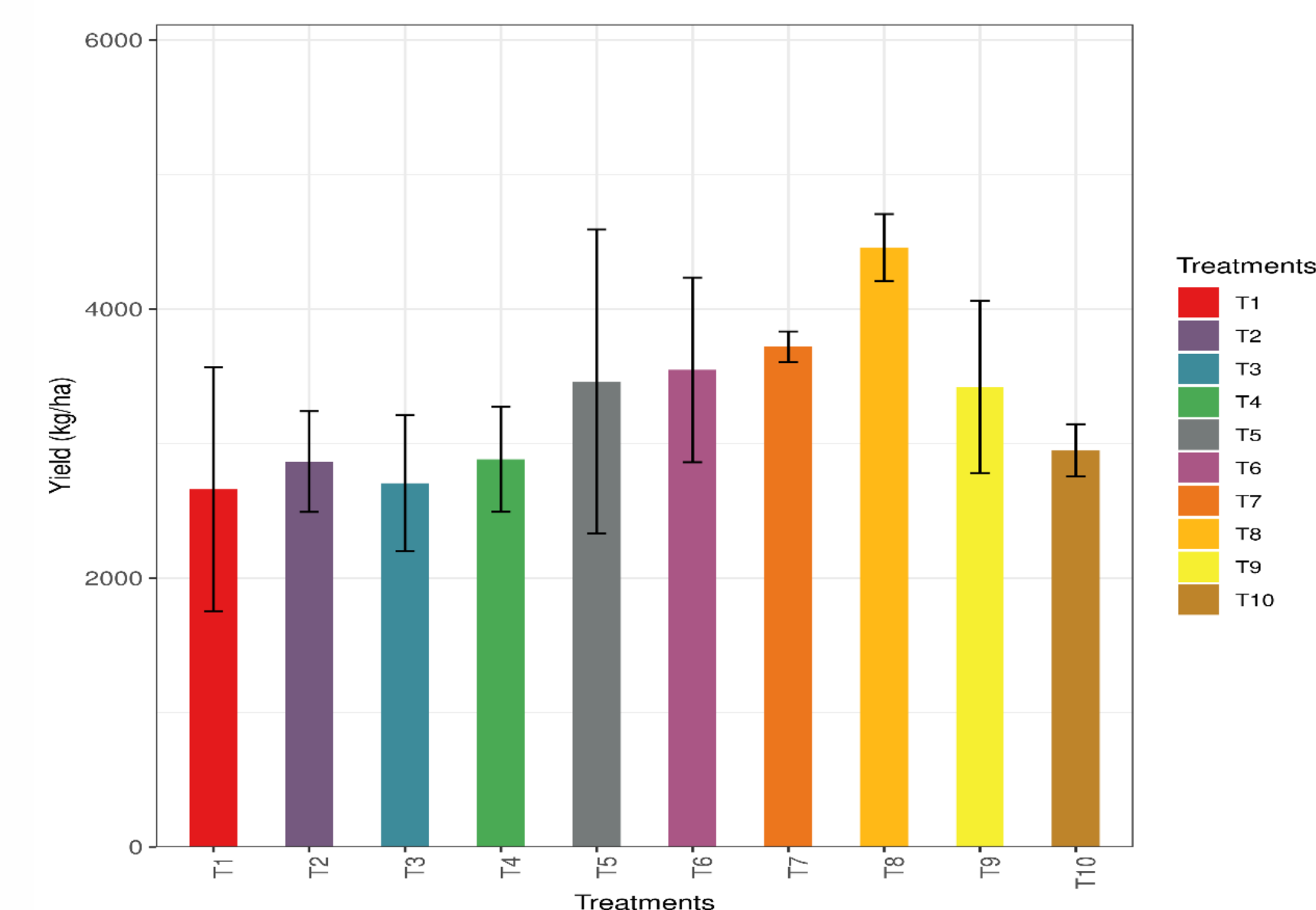


Fig 2. Effect of treatments on total fruit yield

CONCLUSION

Nutrient management showed significant effect on yield and quality in chilli. The results obtained from the experiment revealed the significant influence of soil amendments over KAU POP recommendation and it can be concluded that combined application of gypsum, magnesium sulphate and borax along with KAU POP and lime was effective for increasing fruit yield and quality in chilli.

REFERENCES

1. Rajasekharan, P., Nair, K.M., John, K.S., Sureshkumar, P., Narayanankutty, M.C., and Nair, A.R. 2014. Soil fertility related constraints to crop production in Kerala. *Indian J. Fertil.* 10(11): 56-62.

