



KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE

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CERTIFICATE

This is to certify that the soil nutrient sensor **NutRE**, which was developed by m/s Biota Precision Agriculture Private Limited, Powdikonam, Thiruvananthapuram, Kerala was evaluated by the College of Agriculture, Vellayani, Thiruvananthapuram, under Kerala Agricultural University, in the postgraduate study entitled "*Sensor Based Nutrient Management in Tomato (*Solanum lycopersicum*)*" (approved by the College level Council of College of Agriculture, Vellayani, Kerala Agricultural University).

The study was conducted under four land-use systems, namely vegetable-based cropping system (VS), coconut-based mixed farming system (CS), homestead farming system (HS), and fallow land (FS). The sensor readings of **NutRE** showed an average agreement of 88.97% with the corresponding standard laboratory soil test values for the nutrients N, P, K, Ca, Mg, S, Fe, Zn, and Cu.

Nutrient-wise agreement (%) between **NutRE** readings and soil test values are given below:

Sl. No.	Nutrient	Accuracy (%)				
		VS	CS	HS	FS	Average
1	Nitrogen (N)	88.10	88.59	84.99	83.99	86.42
2	Phosphorus (P)	89.38	83.46	87.28	85.71	86.46
3	Potassium (K)	85.59	89.05	89.30	86.59	87.63
4	Calcium (Ca)	91.18	93.70	91.22	96.00	93.03
5	Magnesium (Mg)	88.33	88.81	85.01	86.73	87.22

Sl. No.	Nutrient	Accuracy (%)				
		VS	CS	HS	FS	Average
6	Sulphur (S)	90.70	89.13	89.49	88.26	89.39
7	Iron (Fe)	89.95	91.34	88.20	90.04	89.88
8	Zinc (Zn)	90.72	87.28	89.28	90.42	89.42
9	Copper (Cu)	91.07	89.69	89.97	94.22	91.24
	Average	89.45	89.01	88.30	89.11	88.97

The study further indicates that a minimum of two sampling events using **NutRE** is sufficient to achieve satisfactory accuracy and precision. This approach offers a possibility of enhancing operational efficiency by reducing time and field measurement effort without compromising data reliability.

Based on the results of the completed PG study, it is revealed that **NutRE** is a reliable and effective tool for rapid soil nutrient assessment and precision nutrient management.

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