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NUTRIENT REQUIREMENTS OF FINGER MILLET BASED ON SOIL TEST CROP RESPONSE CORRELATION APPROACH

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ABSTRACT

Field experiment on finger millet was conducted at Agricultural Research Station, Igatpuri based on soil test crop response approach, using thirteen different NPK fertilizer combinations and three absolute control treatments. The basic parameters *viz.*, nutrients requirement (NR kgq^{-1}) per cent contribution from soil (%CS) and per cent contribution from fertilizers, were calculated and using these basic parameters, fertilizer prescription equations for yield targeting in finger millet were developed.

Key words : NR kgq^{-1}, %CS, %CF, Fertilizer prescription equations.

Finger millet is a minor millet commonly known as Nagli, grown in the hilly and Ghat Zones of Western Maharashtra. The productivity of finger millet is very low due to of imbalanced and unscientific scanty use of fertilizers. The fertilizer prescription equations for making fertilizer recommendations take in to account the yield target of the crop to be taken, the soil test values for available N, P and K nutrients in the soil and the nutrient requirement to harvest preset a yield target. The yield targeting approach is based on soil testing, and it ensures balanced and judicious use of fertilizers.

MATERIALS AND METHODS

A standard field experiment was conducted on Finger Millet, var. cv RAU-8 at the Agricultural Research Station, Igatpuri in the Submontane Zone of the jurisdiction of the Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra state. The soil type mixed loamy, isohyperthermic of the typic Ustropept family. The field was divided in to four equal strips and four artificial fertility gradients were prepared based on the fertility gradient approach (Ramamoorthy *et al.*, 1967) by applying graded doses of N, P and K fertilizers (Table 1) so as to get a large variation in one and the same field to evaluate the set relationship between the yield of the crop and fertility. Maize was grown for fodder as an exhaust crop to stabilize the soil nutrients and to create equilibrium conditions. After harvest of the exhaust crop, the field was well prepared for the test crop i.e. finger millet, without disturbing the fertility gradients. Each fertility gradient strip was further divided in to sixteen equal plots and the seedlings of finger millet which were grown on seed bed one month earlier collected at 15 cm and analysed for available N, P, K content. Thirteen plots in each fertility strip were superimposed with different NPK fertilizer treatment combinations (Table 2) with five levels of N (0,15,30,60 and 60 kg N ha^{-1}) four levels of P_2O_5 (0,15,30 and 45 kg P_2O_5 ha^{-1})and four levels of K_2O (0,10,20 and 30 kg ha^{-1}) (Table 3). The remaining plots in each fertility strip were kept as untreated control. The fertilizers used were urea, single super phosphate and muriate of potash. The entire P and K and half N doses were applied at the time of transplanting and remaining half dose of Nitrogen was applied 25 days after transplanting. At harvest the grain and straw yields from each plot were recorded and the grain and straw samples were analysed for N, P and K concentration and the uptake of these nutrients were calculated.

Table 1 : Fertilizer applied to maize crop.

	N Kg ha^{-1}	P_2O_5 Kg ha^{-1}	K_2O
L_0	0	0	0
L_1	75	50	50
$L_{1/2}$	150	75	75
L_2	300	200	200