

## Fertilizer phosphorus prescription with and without FYM for the desired yield target of 70 qha<sup>-1</sup> of rice

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### ABSTRACT

With a view to assess the extent of fertilizer phosphorus requirement for an yield target of 70 qha<sup>-1</sup> of rice(ADT-36) during *kharif* season , the gradient experiment-rice(ADT- 43) followed by test crop experiment-rice(ADT- 36) were conducted on Vertisol based on STCR approach. Making use of the data generated from field experiment, basic parameters were estimated, fertilizer adjustment equations were developed. The basic data obtained as NRqha<sup>-1</sup>, %CS and %CF for phosphorus were 12.53,61.07 and 10.67, respectively. The efficiency of FYM with respect to P was 16.48. The results revealed at 20 kg soil available phosphorus ha<sup>-1</sup>, the fertilizer P requirement was 100 kgha<sup>-1</sup>. With the conjoint use of FYM, the fertilizer P dose was reduced to 87 kgha<sup>-1</sup>.

**Key words :** STCR, Rice, Fertilizer adjustment equations, Fertilizer, Phosphorus doses

To meet the ever-growing food demand in India, increasing productivity of intensive cropping systems is desirable through efficient fertilizer use without impairing soil health. Judicious use of fertilizers based on soil tests increases the crop yield and fertilizer use efficiency. The targeted yield concept was advocated by Ramamoorthy *et al.* (1967), which provides the balanced nutrition to the crop according to the actual requirement of the crop and soil fertility conditions. Use of imbalanced and highly chemical fertilizers attributed multiple nutrient deficiencies particularly in the irrigated areas, therefore integration of chemical fertilizers with organic sources became essential (Sharma and Singh, 2002). The object to this investigation is to prescribe fertilizer phosphorus based on soil available P status for specific yield target of rice in order to recommend to the farmers.

### MATERIALS AND METHODS

A field experiment on rice (ADT-43) was conducted at an Experimental Farm, Annamalai University,

Annamalainagar. The initial soil belongs to Kondal series, pH 7.7 EC 0.48 dSm<sup>-1</sup>,CEC 29.70 cmol(p<sup>+</sup>)kgha<sup>-1</sup>. The available NPK states were 196, 9.14,270 kgha<sup>-1</sup>, respectively. The field layout comprised four strips (I, II, III and IV), in which the needed variation in soil fertility for phosphorus was deliberately created (Dev *et al.*,1978). Fertilizer levels N<sub>0</sub>P<sub>0</sub>K<sub>0</sub>, N<sub>1/2</sub>P<sub>1/2</sub>K<sub>1/2</sub>, N<sub>1</sub>P<sub>1</sub>K<sub>1</sub> and N<sub>2</sub>P<sub>2</sub>K<sub>2</sub> were given to strip I, II, III and IV, respectively. N was applied through urea as per blanket recommendation. P and K were applied based on their fixing capacity through SSP and MOP, respectively. Strip I, II, III and IV received 0, 41, 82 and 164 kgha<sup>-1</sup> phosphorus through SSP. After the, harvest, grain yield, P uptake, soil available P status were recorded and furnished in Table 1. Each strip was further subdivided into 24 plots. Treatments consisted of 5 levels of N(0, 50, 100, 150 and 200 kgha<sup>-1</sup>), 4 levels of P<sub>2</sub>O<sub>5</sub>(0, 30, 60 and 90 kgha<sup>-1</sup>),3 levels of K<sub>2</sub>O kgha<sup>-1</sup>(0.40 and 80 kgha<sup>-1</sup>), 2 levels of FYM 0, 12.5 tha<sup>-1</sup> and 2 levels of *Azospirillum*, 0, 2 kgha<sup>-1</sup>. Initial soil samples were collected plot-wise

**Table 1 : Effect of graded levels of P<sub>2</sub>O<sub>5</sub> fertilizer on soil available P status, P uptake and grain yield of gradient experiment- rice (ADT-43)**

Strip	Fertilizer P <sub>2</sub> O <sub>5</sub> Applied(kgha <sup>-1</sup> )	Soil available P status(kgha <sup>-1</sup> )	P Uptake (kgha <sup>-1</sup> )	Grain yield (kgha <sup>-1</sup> )
I	0	9.57	10.84	2368
II	41	17.60	20.25	3351
III	82	25.10	29.37	4774
IV	164	34.23	35.61	5692
S.E.±		1.48	0.61	40.33
C.D. (P=0.05)		3.26	1.32	87.86