# Soil test based fertilizer prescription equations for wheat with conjoint use of manure and chemical fertilizers

N.M. KONDE, NILAM KANASE, S.M. JADHAO AND J.D. PATIL

See end of the article for authors' affiliations

## ABSTRACT Divergent field

Correspondence to : **N.M. KONDE** Department of Soil Science and Agricultural Chemistry, Dr. Panjabrao Deshmuk Krishi Vidhyapeeth, AKOLA (M.S.) INDIA

Accepted : March, 2008

Divergent field experiments were conducted on the experimental farm of the Soil Test Crop Response Correlation Scheme, M.P.K.V., Rahuri. The experiment was conducted on four series (Typic chromustert) during the year 2000-2001, based on the fertility gradient approach (Ramamoorthy *et al.*, 1967). The data on initial soil test values for NPK, yield of grain, uptake of NPK by the crop and fertilizer nutrients applied were used to calculate the basic parameters vise nutrient requirement, contribution from soil, contribution from fertilizer and the contribution from FYM. Using the basic data, yield targeting equations for wheat were mathematically computed. The nutrient requirement to produce one quintal of wheat was 2.56 kg N, 0.64 kg  $P_2O_5$  and 1.34 kg  $K_2O$ . The contribution from soil was 19.42, 66.30 and 6.85 per cent in respect of N,  $P_2O_5$ , and  $K_2O$  respectively. While the coefficient of FYM was 2.08 N, 1.93  $P_2O_5$  and 0.21  $K_2O$ , which was deducted from the equation to reduce the fertilizer dose.

Key words : Wheat, Yield, Soil test, FYM, Fertilizer equation.

The wheat crop occupies an area of 8.79 lakh ha in the state of Maharastra with average productivity of 1187 kg ha<sup>-1</sup> (Anonymous, 2000). Wheat crop requires large amount of nitrogen ranging from 100 to 120 kg ha<sup>-1</sup>. The fertilizer recommendations based on soil test by using the adjustment equations for economic yield enables to quantify the fertilizer doses according to need of the crop and fertility status which in turn gives the higher response yardsticks and net profit to the farmers (Sharma *et al.*, 1990). So an attempt was made to develop Soil test based fertilizer prescription equations for wheat with conjoint use of manure and chemical fertilizers

## MATERIALS AND METHODS

The present investigation was carried out by conducting a field experiment with test crop as a wheat by conjoint use of manure and chemical fertilizers at Soil Test Crop Response Correlation Scheme, Mahatma Phule Krishi Vidyapeeth, Rahuri during 2000-2001 on Otur (Typic Haplusterts) soil series of Vertisol. The field was divided into four equal strips and fertility gradients were created in the field by applying N, P and K fertilizers. Maize was grown as an exhaust crop to stabilize the manipulated fertility status. After harvest of the maize crop, soybean was cultivated, after harvest of soybean and without disturbing the four strips of fertility gradient, four FYM blocks across the fertility gradients *i.e.* two blocks with No FYM and two blocks each with 5 Mg ha<sup>-1</sup> FYM and 10 Mg ha<sup>-1</sup> FYM treatments were imposed. Before addition of FYM the blocks were divided into 24 plots, comprising 20 treated and 4 plots. FYM was applied during *kharif* season.

I. FYM blocks	II. Nutrient levels (kg ha <sup>-1</sup> )					
$F_0 = No FYM$ $F_1 = 5 Mg ha-1$ $F_2 = 10 Mg ha-1$	$N_0 = 0  N_1 = 50  N_2 = 100  N_3 = 150  N_4 = 200$	$\begin{array}{rrrr} P_0 = & 0 \\ P_1 = & 50 \\ P_2 = & 100 \\ P_3 = & 150 \end{array}$	$K_0 = 0$ $K_1 = 50$ $K_2 = 100$			

## Treatment details:

For wheat (rabi):

(	/				
III. Treatmen	t combinations		:	24	
1. $N_1 P_0 K_0$	7. $N_2 P_1 K_1$	13.	$N_3P_2K_2$		19. $N_4 P_3 K_1$
2. $N_1 P_1 K_0$	8. $N_2 P_2 K_0$	14.	$N_3P_3K_0$	)	20. $N_4 P_3 K_2$
3. $N_1 P_1 K_1$	9. $N_2 P_2 K_1$	15.	N <sub>3</sub> P <sub>3</sub> K		21. $N_0 P_0 K_0$
4. $N_2 P_0 K_0$	10. $N_2 P_2 K_2$	16.	$N_3P_3K_2$		22. $N_0 P_0 K_0$
5. $N_2 P_0 K_1$	11. $N_{3}P_{0}K_{0}$	17.	$N_4P_2K_1$		$23. N_0 P_0 K_0$
6. $N_2 P_1 K_0$	12. $N_{3}P_{1}K_{1}$	18.	$N_4 P_2 K_2$	1	24. $N_0 P_0 K_0$

Basic data required for computation of fertilizer adjustment equation (without FYM):

The basic data of nutrient requirement, contribution of soil available N, P and K and contribution of fertilizer NPK were calculated as per the procedure given by Dev *et al.* (1978)

## Fertilizer adjustment equation:

The basic data (NR, CS and CF) were used for