

Yield and quality of wheat grains as influenced by conjoint use of manures and fertilizers in vertisol

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ABSTRACT

A field experiment was carried out on clay soil (Typic haplustert) to study the effect of conjoint use of manures and fertilizers on yield and quality of wheat grains during *rabi* 2005-06. Yield and grain quality parameters of wheat influenced significantly due to application of manures and fertilizers. The highest yield and quality parameters like grain appearance score, seed index and hectoliter weight were recorded under application of 180:40:42 kg NPK ha⁻¹ on STCRC basis, while least yellow berry incidence and the highest crude protein content were recorded under conjoint application of chemical fertilizers 90:20:21 kg NPK ha⁻¹ + 10 t FYM + 3.25 t neem cake.

Key words : Wheat, Yield, Quality, Manures.

Wheat (*Triticum aestivum* (L.) em. Thell) is an important cereal crop of India having production potential of 72.5 million tones in 2006-07 (Anonymous, 2007). The area and production of wheat in Maharashtra were 1031 thousand hectare and 1420 thousand tonnes, respectively in the year 2005-06 (Anonymous, 2006). Wheat is an important source of carbohydrates, proteins and minerals like phosphorus, magnesium, iron, copper, zinc and vitamins like thiamine, riboflavin, niacin and vitamin E. On a global basis, wheat provides more nourishment for the people than any other food sources. Thus, grain quality has immense importance in human nutrition. In India, protein deficiency is common amongst the children belonging to the low income groups particularly in North-Eastern states of country. Hence, problem of malnutrition can be overcome partly by improving the quality and quantity of proteins in a basic staple food like wheat through genetic improvement and some agronomic managements. Although all wheat quality characteristics are genetically controlled it had long been known that the cultivation environments like soil and climate are also important as a modifier. Among the factors of quality crop production on sustainable basis, soils, fertilizers and moisture are main factors which alter grain quality.

Thus, the present investigation is an attempt to study and generate scientific information on changes in yield and quality of wheat grains due to application of manures and fertilizers alone and in combination in Vertisols.

MATERIALS AND METHODS

The field experiment was conducted during *rabi* season of 2005-06 at Soil Test Crop Response Correlation Scheme, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra in a Randomized block design with eight treatments and three replications. The soil of the experimental area is grouped under the order Vertisol (Typic haplustert), Otur soil series, and alkaline in nature having pH 8.02 low salt content (EC 0.20 dSm⁻¹) with low nitrogen (165.20 kg ha⁻¹) medium phosphorus (14.95 kg ha⁻¹) and high in potassium (392 kg ha⁻¹).

The eight treatment combinations are : control, general recommended dose application of fertilizers on STCR basis *i.e.* only inorganic. While other treatments were only organic *i.e.* application of graded level of FYM and neem cake as indicated in the Table. Eighth treatments comprised of application of 50% dose of STCRC through organic and 50% dose through chemical fertilizer *i.e.* conjoint application of manures and fertilizers.

The grains of wheat were taken for quality judgement *i.e.* grain appearance score (A.A.C.C., 1976) thousand grain weight of seed (A.A.C.C., 1976) hectoliter weight (Mishra *et al.*, 1998). For grain appearance score, score out of 10 was recorded. The weight of 250 grains was recorded and multiplied by four and mean values were reported for seed index. The observations on hectoliter weight of wheat grains were recorded by using the hectoliter instrument developed by quality group scientists, Directorate of Wheat Research (ICAR) and hectoliter weight of grains was recorded as kg hl⁻¹. Yellow berry incidence was recorded by observing yellow spots on the