

Research  
Paper

## Recycling effect of wheat straw incorporation and inorganic fertilizer on growth, yield and quality of wheat and their residual effect on yield of succeeding *Kharif* pearl millet

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### ABSTRACT

A field experiment was conducted for two consecutive years on same site at AAU, Anand, during the year 2005-06 and 2006-07, to evaluate the effect of crop residue management practices and nitrogen on yield and quality of wheat and their residual effect on yield of succeeding *Kharif* pearl-millet. Eighteen treatment combination involving six residue management practices and three levels of nitrogen were tested in factorial randomized block design replicated thrice. Growth and yield attributes, total chlorophyll and protein content of wheat crop were increased due to different residue management treatments and FYM than that of control. Addition of wheat straw with N or  $P_2O_5$  or both proved better than its application alone. However, addition of wheat straw @  $5 \text{ t ha}^{-1}$  along with  $20 \text{ kg N}$  and  $20 \text{ kg } P_2O_5 \text{ ha}^{-1}$  at 30 days before sowing produced significantly the highest grain and straw yields of wheat. All the growth and yield contributing character, including the grain and straw yields as well as protein content of wheat were recorded highest under the application of  $120 \text{ kg N ha}^{-1}$  to wheat. Incorporation of wheat straw @  $5 \text{ t ha}^{-1}$  alone at 30 days before sowing, wheat straw plus  $20 \text{ kg } P_2O_5 \text{ ha}^{-1}$  at 30 days before sowing and wheat straw along with  $20 \text{ kg N}$  and  $20 \text{ kg } P_2O_5 \text{ ha}^{-1}$  at 30 days before sowing showed better residual effect in term of yield of succeeding pearl millet crop.

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**Key words :** Wheat straw incorporation, FYM, Pearl millet, Protein content, Chlorophyll content

### INTRODUCTION

Increasing demand of food to feed the ever growing population along with rising cost of chemical fertilizers and depleting soil fertility owing to intensive cropping system necessitates judicious use of renewable (organic) and non-renewable (inorganic) sources of input energy production which minimize the dependence of crop production on commercial source of energy. Under this junction of national energy crisis, the urgent need is to test easily available alternative sources of energy as farm yard manure, green manuring, rice straw, wheat straw, etc for sustainable crop production and soil health as well to sustain the soil fertility. The complementary effect of organic and inorganic sources may be pronounced in cropping system rather than a single crop.

Crop residues are important renewable organic sources of nutrients. Large quantities of crop residues

are available with the farmers which can be utilized as complementary sources to chemical fertilizer. Besides supplementing the fertilizers for major nutrients, crop residues are also important in improving the soil quality. The incorporation of such a large quantities of crop residues, resulted in temporary immobilization of plant nutrients, due to their wider C:N ratio. There by, leading to nitrogen deficiency at early stage of crop growth even after application of recommendation doses of nitrogen. Therefore, application of urea at the time of field preparation may accelerate the rate of decomposition of crop residues, resulting in to greater availability of nitrate N at early stage of crop growth.

Keeping all this in a view, the present experiment was planned to investigate the "effect of residue management practices and rate of nitrogen on growth and yield of wheat and their residual effect on yield of succeeding pear millet crop".