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Research Paper

Effect of wheat straw incorporation and nitrogen on yield of wheat and soil fertility and their residual effect on succeeding *Kharif* pearl millet crop

K.A. SHAH AND R.H. PATEL

See end of the article for authors' affiliations

Correspondence to :

K.A. SHAH
Department of Agronomy, Anand Agricultural University, ANAND (GUJARAT) INDIA

ABSTRACT

A field experiment was conducted at the Anand Agricultural University, Anand during the year 2005-06 and 2006-07 to study the effect of wheat straw incorporation and inorganic fertilizer on yield of wheat, physiochemical properties of soil at harvest of wheat and yield of succeeding *Kharif* pearl millet crop. Grain and straw yields of wheat was observed significantly the highest under the treatment of wheat straw incorporation @ 5 t ha^{-1} along with 20 kg N and 20 kg P_2O_5 ha^{-1} at 30 DBS. Soil reaction and electrical conductivity did not influenced significantly, but organic carbon content, total nitrogen and available potash status of soil after harvest of wheat were observed maximum under the WSI @ 5 t ha^{-1} at 30 DBS. Available phosphorus status of soil was remained higher under the treatments of WSI @ 5 t ha^{-1} along with 20 kg P_2O_5 ha^{-1} at 30 DBS. Grain and fodder yields of succeeding *Kharif* pearl millet were found significantly superior under the WSI @ 5 t ha^{-1} along with 20 kg N and 20 kg P_2O_5 ha^{-1} at 30 DBS. Each successive increment in levels of nitrogen application significantly linear increase in the grain and straw yields of wheat. Similarly, significant improvement in organic carbon content, total nitrogen and potash status of soil was noted under the application of 120 kg N ha^{-1} over 60 kg ha^{-1} after harvest of wheat. Application of 120 N Kg ha^{-1} to wheat showed its residual effect more pronounced in pearlmillet rain and fodder production than application 60 and 90 N kg ha^{-1}. The interaction effect of grain yield of wheat presented in Table 2 revealed that when the wheat crop was sown under the application of wheat straw @ 5 t ha^{-1} along with 20 kg N and 20 kg P_2O_5 ha^{-1} and fertilized with application of 120 kg N ha^{-1} the highest grain yield was recorded.

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Key words : Wheat Straw incorporation, Wheat yield, Residual effect

INTRODUCTION

The key to improve the sustainability of agricultural farming system is soil productivity. Soil fertility and productivity to a great extent depends on soil organic matter. Management of crop residues and returning of farm waste to cultivated field offer the best possible means of restoring and maintaining the organic matter content of the soils.

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.

In view of the above, the present investigation was undertaken to study the "Effect of wheat straw incorporation and nitrogen on yield of wheat and soil fertility and their residual effect on succeeding *Kharif* pearl-millet crop".

MATERIALS AND METHODS

A field experiment was conducted at College Agronomy Farm, Anand Agricultural University, Anand, (22^0-35^l N and 72^0-55^l E) with an altitude of 45.1 m above mean sea level during the *Rabi* and *Kharif* seasons of the years 2005-06 and 2006-07. The soil of the experimental field was loamy sand in texture (locally known as *Goradu* soil) having pH ranging from 7.8 to 8.0. The experimental soil was low in organic carbon and total nitrogen, medium in available phosphorus and high in available potassium. Eighteen treatments comprised of all possible combinations of six levels of residue management