

EFFECT OF CROP RESIDUES AND THE GREEN MANURE INCORPORATION IN WHEAT ON GROWTH, NUTRIENT UPTAKE AND YIELD UNDER RICE BASED CROPPING SYSTEM

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Abstract: A field experiment was conducted at the Research Farm, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during *Rabi*, season 2008-2009 to study the effect of crop residues and the green manure incorporation in wheat on growth, nutrient uptake and yield under rice based cropping system. The seven treatments namely no straw and 0kg RDF (T₁), no straw + RDF (T₂), straw burn+RDF(T₃), straw incorporated +RDF (T₄), straw incorporated with 25% N+ RDF*(T₅), straw incorporated with 5t GM/ha+RDF* (T₆), straw incorporated with microbial culture + RDF (T₇) were replicated four times in RBD. The NPK uptake in seed and stover significantly increase by crop residue management compared does control. The higher nitrogen (52.79 kg ha⁻¹) and phosphorus uptake (15.23 kg ha⁻¹) in seed was found with straw burn+RDF (T₃), but, potassium uptake in seed highest (2.27 kg/ha) was found with straw incorporated with 5t GM/ha+RDF*(T₆) while potassium uptake was found with straw incorporated along with 25% N as starter dose and highest phosphorus uptake was observed with straw incorporated along with microbial culture. The yield parameter affected by different treatment. The highest no. of tiller and highest spike was observed with straw bunt which was significant to control but non-significant to all other treatment. The higher seed and stove yield was found with straw burnt and straw incorporated along with 25% N as starter dose. The higher seed yield (26 q/ha) was recorded with straw burnt+RDF (T₃) which was also similar to straw incorporated +RDF (T₄), straw incorporated with 25% N+RDF* (T₅), Straw incorporated with 5t GM/ha+RDF*(T₆) and straw incorporated with microbial culture +RDF (T₇) but significantly difference between no straw and 0 kg RDF (T₁) and no straw +RDF (T₂). The lowest seed yield (14q/ha) was recorded in no straw and 0 kg RDF (T₁). The highest stover yield (54.5 q/ha) was found in straw incorporated with 25%N+RDF*(T₅) and lowest (35.75 q/ha) was with no straw and 0 kg RDF (T₁). Significantly the highest harvest index (34.90%) was obtained with straw burnt+RDF (T₃). Whereas, the lowest harvest index (28.14%) was obtained with no straw and 0 kg RDF (T₁).

Keyword: crop residues, green manure and wheat yield

REFERENCE

- Bellakki, M. A. and Badanur, V. P.** (2000). Residual effect of crop residues in conjunction with organic, inorganic & cellulolytic organism on chickpea grown on verisol. *Journal Indian Soc. Soil Sci.* **48**(2): 393-395.
- Brye, K. R., Longer, D. E. and Gbur, E. E.** (2006). Impact of tillage & residue burning on carbon dioxide flux in wheat-soybean production system. *Journal Indian Soc. Soil Sci.* **70**(1) : 1145-1154.
- Eagle, A. J., Bird, J. A., Hill, J. E., Horwath, W. R. and Kessel, C. V.** (2001). Nitrogen dynamics & fertilizer use efficiency in the rice following Straw incorporation and winter flooding. *J. Agron.* **93**:1346-1354
- Hussain, T., Javaid, T., Parr, J. F., Jilani, G. and Haq, M. A.** (1999). Rice and wheat production in Pakistan with effective microorganisms. *Journal Am. Altern. Agric.* **14**(1) : 30-36.
- Jat, M. L., Pal, S. S., Shukla, L., Mathur, J. M. S. and Singh, M.** (2004). Rice residue management using cellulolytic fungi & its effect on wheat yield & soil health in rice-wheat cropping system. *Journal Indian Agric. Sci.* **74**(3) : 117-120.
- Kharub, A. S., Sharma, R. K., Mongia, A. D., Chhokar, R. S., Tripathi, S. C. and Sharma, V. K.** (2004). Effect of rice straw removal, burning & incorporation on soil properties and crop productivity under rice-wheat system. *Journal Indian Agric. Sci.* **74**(6) :295-299.
- Kher, D.** (1991). Effect of N application and green manure to rice in wheat-moong-rice crop rotation. *Haryana Journal Agron.* **7**(1) : 94-97.
- Kundu, S., Kundu, A. L. Pal, S. and Mandal, N. N.** (2006). Studies on crop yield and changes on soil properties as influenced by sustainable nutrient management in rice wheat cropping system. *Journal Interacademia* **10**(1) : 36-39.
- Mistra, B., Sharma, P. K. and Bronson, K. F.** (2001). Decomposition of rice straw and mineralization of carbon, nitrogen, phosphorus and potassium in wheatfield soil in Western UP. *Journal Indian Soc. Soil Sci.* **49**(3) : 419-424.
- Sanford, J. O.** (1982). Straw and tillage management practices in soybean-wheat double-cropping. *Journal Agron.* **74**: 1032-1035.
- Shukla, L. and Mathur, R. S.** (2000). Effect of biodegraded sugarcane trash on yield and nutrient uptake by wheat crop. *Journal Indian Soc. Soil Sci.* **48**(3) : 520-522.
- Singh, M. and Sharma, S. N.** (2000). Effect of wheat residue management practices & nitrogen rates on productivity and nutrient uptake of rice-wheat cropping system. *Journal Indian Agric. Sci.* **70**(12) 835-839.
- Tiwari, V. N., Tiwari, K. N. and Upadhyay, R. M.** (2000). Effect of crop residues and biogas slurry incorporation in wheat on yield and soil fertility. *Journal Indian Soc. Soil Sci.* **48**(3) : 515-520.
- Verma, T. S. and Dixit, S. P.** (1989). Paddy straw management in paddy-wheat cropping system in north-west Himalayan. *Oryza.* **26**(1-2) 48-60