

## EFFECT OF LAND CONFIGURATION METHODS AND SULPHUR LEVELS ON GROWTH, YIELD AND ECONOMICS OF INDIAN MUSTARD [*BRASSICA JUNCEA* L.] UNDER IRRIGATED CONDITION

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**Abstract:** A field experiment was conducted at Varanasi, during *rabi* season of 2015-16, to study the effect of land configuration and sulphur levels on yield attribute, yield and economics of Indian mustard [*Brassica juncea* (L.)] on a sandy clay loam soil at Agriculture research farm, Institute of Agricultural Sciences, B.H.U., Varanasi, U.P. The investigation was carried out in a split plot design with 3 replications. The treatment comprised of four land configuration methods (-M<sub>1</sub> - Flat bed broadcasting - M<sub>2</sub> - Furrow sowing M<sub>3</sub> - Flat line sowing and M<sub>4</sub> - Ridge side sowing) as main plot factor and four sulphur levels (control, 20 kg S ha<sup>-1</sup>, 30 kg S ha<sup>-1</sup>, 40 kg S ha<sup>-1</sup>) as sub plot factor. Furrow sowing was significantly superior over other land configuration methods in terms of growth parameter, yield attributes and yield as well as economics of crop cultivation. The different levels of sulphur showed a positive response on influencing the growth attributes, yield attributes and yield of mustard. The application of 40 kg S ha<sup>-1</sup> was significant over other sulphur levels in terms of growth parameters, yield attributes and yield and profitability of mustard crop cultivation.

**Keywords:** Economics, Growth and yield, Land configuration, Indian mustard, Sulphur levels

### REFERENCES

- Ali, M.H., Zaman, S.M.H. and SMA, Hossain, (1996). Variation in yield, oil and protein content of rapeseed(*B. campestris*) in relation to levels of nitrogen, sulphur and plant density, *Indian Journal of Agronomy*, **41**(2) : 290-295.
- Anonymous (2016). Directorate of Rapeseed and Mustard Research, [http://www.drnr.res.in/about\\_rm.html](http://www.drnr.res.in/about_rm.html).
- Aulakh, M.S., Pasricha, N.S. and Sahota, N.S. (1980). Yield, nutrient and quality of mustard crop as influenced by nitrogen and sulphur fertilizers. *J. Agric. Sci. Camb.*, **94**(1):545-549.
- Banerjee, A., Dutta, J.K. and Mondal, N.K. (2010). Impact of different combined doses of fertilizers with plant growth regulators on growth yield of mustard (*Brassica campestris* cv. B9) under old alluvial soil of Burdwan, West Bengal, India. *Front. Agriculture, China*, **4**(3) :341-351.
- Chiroma, A. M., Folorunso, O. A. and Alhassan, A. B. (2006). The effects of land configuration and wood-shavings mulch on the properties of a sandy loam soil in northeast Nigeria. 1. Changes in chemical properties, *Tropicicultura*, **24**(3) : 129.
- Gomez, K.A. and Gomez, A.A. (1976). Statistical procedures for agricultural research, (2nd Ed. 1984), John Willey and Sons Inc. New York, USA.
- Jyoti, Kumari, Sushanta Kumar, Naik, Mandal, Mitali and Kumar, Das Dilip (2012). Performance of different sources of sulphur on the yield and quality of rapeseed(*Brassica campestris* L.), *Journal of the Indian Society of Soil Science*, **60**(3) :218-224.
- Khanpara, V.D., Porwal, B.L. and Patel, J.C. (1993). Effect of levels and modes of sulphur application on biochemical changes in mustard (*Brassica juncea*) leave, *Indian Journal of Agronomy*, **38**(3) : 410-413.
- Kumar, R. and Trivedi, S.K. (2012). Effect of levels and sources of sulphur on yield, quality and nutrient uptake by mustard (*Brassica juncea* L.), *Progressive Agriculture*, **12**(1) :69 -73.
- Kuotsu, K., Das, A., Lal, R., Munda, G. C., Ghosh, P. K. and Ngachan, S. V. (2014). Land forming and tillage effects on soil properties and productivity of rainfed groundnut(*Arachis hypogaea* L.)-rapeseed(*Brassica campestris* L.) cropping system in north-eastern India, *Soil and Tillage Research*, **142**: 15-24.
- Li, Q.Q., Zhou, X.B., Chen, Y.H. and Yu, S.L. (2010). Seed yield and quality of winter wheat in different planting patterns under deficit irrigation regimes, *Plant, Soil and Environment*, **56**:482-487.
- OM, H., Rana, K. S. and Ansari, M. A. (2013). Productivity and nutrient uptake of mustard (*Brassica juncea*) influenced by land configuration and residual and directly applied nutrients in mustard under limited moisture conditions, *The Indian Journal of Agricultural Sciences*, **83**(9) : 933-938.
- OM, H., Rana, K. S. and Ansari, M. A. (2013). Productivity and nutrient uptake of mustard (*Brassica juncea*) influenced by land configuration

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and residual and directly applied nutrients in mustard under limited moisture conditions. *The Indian Journal of Agricultural Sciences*, **83**(9) : 933-38.

**Parihar, C. M., Rana, K. S. and Kantwa, S. R.** (2010). Nutrient management in pearl millet (*Pennisetum glaucum*)-mustard(*Brassica juncea*) cropping system as affected by land configuration under limited irrigation, *Indian Journal of Agronomy*, **55**(3) :191-196.

**Parihar, C. M., Rana, K. S. and Parihar, M. D.** (2009). Crop productivity, quality and nutrient uptake of pearl millet (*Pennisetum glaucum*)-Indian mustard (*Brassica juncea*) cropping system as influenced by land configuration and direct and residual effect of nutrient management, *Indian Journal of Agricultural Sciences*, **79**(11) : 927-930.

**Parihar, C. M., Rana, K. S., Jat, M. L., Jat, S. L., Parihar, M. D., Kantwa, S. R. and Sharma, S.** (2012). Carbon footprint and economic sustainability of pearl millet-mustard system under different tillage and nutrient management practices in moisture stress conditions, *African Journal of Microbiology Research*, **23** :5052-5061.

**Rathore, R. S., Singh, R. P. and Nawange, D. D.** (2010). Effect of land configuration, seed rates and fertilizer doses on growth and yield of black gram [*Vigna Mungo* (L.) Hepper], *Legume Research-An International Journal*, **33**(4) : 274-278.

**Ray, Sen K., Gupta, K., Pal, A. K. and Banerjee, H.** (2015). Effects of sulphur fertilization on yield, S uptake and quality of Indian mustard under varied irrigation regimes, *Plant, Soil and Environment*, **61**(1) :6-10.

**Sing, H. G. and Sahu, M. P.** (1986). Reponse of oilseed to sulphur. *Fert. News.*, **31**: 23-30.

**Singh, M. and Kumar, M.** (2014). Effect of nitrogen and sulphur levels on seed yield and some other characters in mustard (*Brassica juncea* L.), *International Journal of Agricultural Sciences*, **10**(1) : 449-452.

**Singh, U.,Tomar, S.S. Rameshwar and Choudhary, S.** (2015). Yield, nutrient uptake and economics of Indian mustard as influenced by varieties, sources and levels of sulphur. *Annals of Plant and Soil Research* **17**(3): 266-268.

**Tiwari, R.C. Kumar, S. and Singh, D.P.** (2003). Response of crop to doses and sources of Sulphur in Eastern U.P, *Fertilizer News*, **48**(8): 41-42.

**Verma, C. K., Prasad, K. and Yadav, D. D.** (2012). Studies on response of sulphur, zinc and boron levels on yield, economics and nutrients uptake of mustard (*Brassica juncea* L.), *Crop Research*, **44**(1/2) :75-78.

**Sardana, Virendra, Atwal, A.K. and Sangha, M.K.** (2008). Effect of foliar application of sulphur on yield, quality and economics of Indian mustard [*Brassica Juncea* (L.) Czern & Coss], *Research on Crops*, **9**(3) :728-730.

**Yadav, H.K., Thomas, T. And Khajuria, V.** (2010). Effect of different levels of sulphur and biofertilizer on the yield of Indian mustard (*Brassica juncea* L.) and soil properties. *Journal of Agricultural Physics*,**10**:61-65.

**Zhang, J., Sun, J., Duan, A., Wang, J., Shen, X. and Liu, X.** (2007). Effects of different planting patterns on water use and yield performance of winter wheat in the Huang-Huai-Hai plain of China, *Agric. Water. Management*, **92**:41-43.