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Canola Response to Zinc, Sulfur and Boron Fertilisation

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Abstract

In order to evaluate the effect of boron (B), zinc (Zn) and sulfur (S) application on quantitative and qualitative agronomic characteristics of rapeseed (*Brassica napus* L. var. Hayola 401) in Rasht region, a field experiment was conducted at Rice Research Institute of Iran (Rasht) in a complete randomised block design with 8 treatments and 3 replications. Treatment consisted of control, B, Zn, S, B + Zn, B + S, Zn + S and B + Zn + S. Sulfur was added at the rate of 100 kg ha^{-1} before sowing, boron was added as Borax ($Na_2B_4O_7$, $10H_2O$) at the rate of 1.5 kg ha^{-1}, zinc was added as Zn 15 % EDTA at the rate of 1.5 kg ha^{-1} were applied to the soil. Results showed that there were significant differences among treatments on traits, seed yield, oil yield, protein content, siliques number at plant, seed number at silique, thousand-seed weight, B, Zn and S contents of seed, oleic, linoleic, linolenic, palmitic, stearic, erusic fatty acids content of rapeseed oil. Highest seed yield (4157.6 kg ha^{-1}), oil yield (1770.2 kg ha^{-1}), siliques number at plant (195.92 number), seed number at silique (34.31 number) and thousand- seed weigh (3.7 gr) were obtained with B + Zn + S treatments. Maximum protein content in seed of rapeseed (24.62 %) was observed with Zn treatment. Maximum seed B, Zn and S concentrations were recorded in B+ Zn + S treatment which was 15.7, 26.38 and 577.42 mg g^{-1}, respectively. Highest percentage oleic (234.8 mg g^{-1}) and linolenic (26.98 mg g^{-1}) acid in oil seed were obtained from B + Zn + S treatments. Among the different treatments the highest linoleic acid (55.98 mg g^{-1}) in oil was recorded in B + Zn treatment. Maximum stearic and erusic acid were obtained from control treatment which was 6.5 mg g^{-1} and 1.01mg g^{-1} respectively. S + Zn treatment produced the highest palmitic acid (15.53mg g^{-1}). This study showed that application of B, Zn and S fertilisers increased quantitative and qualitative yield of canola and improved the fatty acids composition of the oil.

Keywords: Element uptake, fatty acid, microelement, oleic acid, protein seed

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