Effects of nano zinc oxide on the growth and ion content of four wheat cultivars under salinity stress

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Abstract

This pot experiment was conducted to investigate the effects of ordinary and nano forms of zinc oxide on growth and ion content of four wheat cultivars (Niknejad, Iniya, Rowshan and Moghan2) under three salinity levels (0, 75 and 150 mM NaCl). In this experiment, shoot and root dry weight, and concentration of potassium, sodium and zinc in shoots were measured. Results showed that with an increase in salinity level, the shoot and root dry weight and concentration of potassium and zinc in shoot was decreased, but shoot/root dry weight ratio, sodium concentration and sodium/potassium ratio in shoots were increased. Plants provided with nano zinc oxide had higher concentration of zinc, as compared to the ordinary form of zinc oxide. Significant reduction of sodium/potassium ratio in shoots occurred due to plant nutrition of nano zinc oxide. As a result of application of nano zinc oxide, shoot dry weight was increased in Niknejad and Iniya wheat cultivars, but it was decreased in Rowshan and Moghan2 cultivars. The results of this experiment showed that there was significant variation among wheat cultivars in response to the application of nano zinc oxide.

Keywords: Plant nutrition, Sodium to potassium ratio, Salinity stress, Plant response.

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