
The effect of various doses of Cd on productive features and quality of wheat

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Abstract

Similarly to the other heavy metals, cadmium (Cd) is in higher concentrations toxic to all living organisms, including plants. The main path by which Cd enters food chain is by the food of plant origin. Therefore, we set experiments to examine to which extent Cd to which wheat grain was exposed during imbibition, can affect later plant growth and Cd content in harvested grain. Winter wheat grains, cultivar Pobeda, were soaked in the following concentrations of CdCl₂, dissolved in deionized water: 0 (control), 10⁻⁵, 10⁻⁴, 10⁻³ and 10⁻² M Cd, for 24 h. Thereafter, grains were briefly rinsed with deionized water and the excess of water removed by filter paper. One portion of seeds was used to assess concentration of Cd. With the increase in Cd concentration on the imbibition solution, the concentration of Cd in grains significantly increased. The other portion of imbibed grains were sown in the field on soil classified as a calcareous, gleyic chernozem in which concentration of Cd in the soil was significantly lower than the maximally allowed (2 mg kg⁻¹). The plants were grown to maturity and analysed at harvest. Plant height, number of spikes per m² and grain yield significantly declined with the increase in Cd concentration in the solution in which grains were imbibed prior to sowing. Concentration of Cd in harvested grains increased up to 40%. Concomitantly, length of spikes, number of spikelets per spike, mass of grains per spike, harvest index and mass of 1000 grains changed to a much lesser extent.

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