

INFLUENCE OF ZINC ON DIFFERENT CONCENTRATIONS ON GROUND STEM AND ROOT GROWTH OF CORN

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Abstract

Many authors who investigated the effect of Zn on seed germination, and growth and development of plants showed that zinc is reducing the seed germination rate, and inhibits the elongation of shoot and root in various plant species. The aim of this research was to investigate the effect of different concentrations of zinc on seed germination, stem and root growth as well as the increase of fresh and dried (dry) weight in corn.

The substance used in the experiments for this type of plant was: Zinc sulfate ($ZnSO_4$) and that in the following concentrations: 10^{-5} , 10^{-4} , 10^{-3} , 10^{-2} , 2×10^{-2} , 4×10^{-2} , 5×10^{-2} , 6×10^{-2} , 8×10^{-2} M. These concentrations have been used in tests in the form of aqueous solutions prepared with distilled water. The action of the substance during the experiment was permanent- permanent treatment (T.P.) and limited- before treatment (P. T.) for 24, 48 and 72. The seeds, before being placed in germination, are cleaned with ordinary water and then with distilled water two or three times. The seeds were germinated in a thermostat at a temperature of $26^\circ C$. The percentage of germinated seeds is determined after 96 hours from the moment they are placed for germination. The determination of the length of the plant organs was done 10 days after the placement of the seeds for germination. Their length is determined by measuring the main shoots and roots and is expressed as the average for a stalk, respectively root. Ten days after the seeds are set for germination, the increase of fresh and dry weight of corn is also determined, depending on the concentrations of $ZnSO_4$.

Based on the obtained results it can be noticed that zinc sulfate in lower concentrations (10^{-5} , 10^{-4} , 10^{-3} M) not only does not inhibit seed germination but in many cases stimulates seed germination, compared to high concentrations (10^{-2} , 2×10^{-2} , 4×10^{-2} , 6×10^{-2} , and 8×10^{-2} M). Zinc sulfate in small concentrations (10^{-5} to 2×10^{-2} M) did not inhibit further growth of previously germinated seeds. High concentrations (4×10^{-2} to 8×10^{-2} M) significantly inhibit further shoot and root growth in germinated seeds.

Small concentrations of zinc sulfate stimulate stem and root growth. The greatest inhibitory effect of high concentrations occurs in root growth because the cell membrane walls are thinner.

Key words: Corn, Germination, Stalk, Root, $ZnSO_4$, Pre-treatment, Permanent treatment.