

Annotation

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The effect of of silicon-potassium fertilizer «Agroglass stimul» on the winter wheat germination under salt stress

The salinity of soils is the typical abiotic factor for the South of Ukraine, which decrease the crop's productivity. The use of fertilizers with complex regulation effects is one of the effective methods to improving plants salt tolerance. Silicon is able to stimulate the native protect reactions of plant by including in its methabolism. The positive effect of silicon fertilizers shown for some crops. Silicon effects on Na⁺ spreading in plants, decreases the speed of Sodium transport to roots and stems of grain crops. This increases the plant tolerance to salt toxication. The aim of the work was to determine the influence of silicon-potassium fertilizer «Agroglass Stimul» on the winter wheat germination at early stage of growth under salt stress.

The object of the study were seeds of winter wheat cultivation "Antonovka". Seeds were soaked in solutions of silicon-potassium fertilizer «Agroglass Stimul» (5, 15, 30, 60 ml/L) and germinated in Petri dishes under controlled parameters during 7 days long. The laboratory germination, length and weight of seedlings and roots of wheat were determined. Seeds (variants 2-5) were grown at 0,1 M sodium chloride solution for induction salt stress.

Laboratory germination of wheat seeds decreased under sodium chloride salinity. The energy of growth and germination increased by 4,7 - 7,1% and 7,5 - 2,5% respectively and compared with salt control. Growing wheat seeds in salinity condition, it was noticed the inhibitions of growth processes. In turn, «Agroglass Stimul» (5 ml/L) increased roots raw weight by 15% but big concentration of fertilizer the inhibitory effect observed. «Agroglass Stimul» increased wheats sprouts raw weight at wide concentration range (5-30 ml/L). «Agroglass Stimul» (5-15 ml/L) the most effectively accumulated the wheat seedlings dry weight, which exceeded the control indexes by 15-17%. «Agroglass Stimul» increased roots dry weight by 27-34% at wide range (5-60 ml/L) compared with salt control. The length of wheat seedlings and root increased by 10% and 11% respectively under «Agroglass Stimul» (5 ml/L) influence. The higher doses (15-30 ml/L) of fertilizer stimulated the wheats root system enlargement.

Thereby, the silicon-potassium fertilizer «Agroglass Stimul» is a regulator of plants tissues osmotic pressure, which at concentration 5-15 ml/L effectively stimulated the growth processes of winter wheat at early stages of germination under salt stress.

Keywords: winter wheat, salt stress, silicon-potassium fertilizer, growth, germination.