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## STUDY OF SPRING WHEAT VARIETIES FOR IDENTIFICATION OF FORMS RESISTANT TO CADMIUM

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**Abstract:** The purpose of our study was the identification of spring wheat varieties resistant to cadmium, a priority pollutant in the East Kazakhstan region. The experiments were carried out in the condition of model environmental pollution on 14-day sprouts of various spring wheat varieties, that were grown on a nutrient mixture, containing 0.1 mM of CaSO<sub>4</sub> and Cd ions at a concentration of 40 mg/l. Screening of spring wheat varieties under the conditions of the model experiment made it possible to identify resistant and sensitive genotypes. In terms of growth and accumulation of cadmium in the aboveground organs, the most resistant to cadmium spring wheat varieties are Samal and Kaiyr, the least resistant are the varieties Lutescens and Zhenis. In terms of growth and accumulation of cadmium in the roots, the most resistant varieties of spring wheat were Kazakhstan-15 and Kazakhstan Early, the most unstable – the variety Lutescens. Chlorophyll *a* is more sensitive to the action of cadmium ions than chlorophyll *b*. Cadmium-resistant varieties can be used in field studies of soil contamination with cadmium to identify promising forms that combine metal resistance with high yield and resistance to weather conditions.

**Keywords:** cadmium, spring wheat, growth parameters, cadmium content, chlorophyll content, sensitive and resistant genotypes

### Background. Objectives and goals

Pollution of the environment, in particular by chemicals, is one of the most powerful factors of destruction of the biosphere components. At present, a large number of pollutants enter the biosphere. Among them, a significant place is occupied by heavy metals. Heavy metals are the most toxic among chemical elements [1].

One of the ways to obtain clean commercial products on soils contaminated with heavy metals is to create, and use in the production, technogenic resistant varieties of agricultural crops. The development of this method raises the initial task of studying gene pool of the cultivated and wild plants and allocation of donors, accumulating minimum amount of contaminants in the commercial part of the crop [2]. The evaluation of selection material and the direction of researches on the principles of the use of attributes, that allow to accumulate a minimum number of ecotoxicants, will make it possible to reduce terms of selection work [3,4]. In connection with the task of studying the gene pool of cultivated plants in conditions of technogenic pollution, the subject of the study was the screening of varieties of spring wheat for metal resistance in order to identify the promising types for cultivation in the East Kazakhstan region, and selection donors that accumulate minimum amount of pollutants.

### Methods

The objects of research are different genotypes of spring wheat from the collection of the Kazakh Research Institute of Agriculture (KIA): Kazakhstan Early, Erythrosperrum, Kaiyr, Lutescens, Zhenis, Kazakhstan-25, Samal, Samgau, Almaken, Kazakhstan-15.

2. The number of chlorophylls *a* and *b* increases in the leaves of most varieties, which, apparently, is due to the activation of the photosynthetic apparatus, provoked by high energy costs, which are associated with the neutralization of the influence of pollutants.

3. More resistant varieties showed less variability in the amount of chlorophyll compared with more sensitive.

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