Comparative assessment of the effectiveness of enhancing phytoextraction with heavy metals by creeping clover (Latin *Trifolium repens L.*) by introducing various drugs that stimulate plant growth and development

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Аnnotation

Among the various methods used, phytoremediation is one of the most inexpensive, safe, innovative and effective tools for rehabilitating soils from heavy metal contamination. The efficiency of this process can be increased by introducing various additives that convert less bioavailable compounds of heavy metals into bioavailable fractions in the soil, and also to increase the rate of transfer of metals to plants.

As **objects of research**, we used seedlings of white creeping clover (hereinafter ‒ Lat. *Trifolium repens L.*), capable of accumulating heavy metals from the environment (soil contaminated with pollutants). To assess the accumulation of heavy metals by plants, they were planted in the soil and heavy metals (Ni, Cu, Cd) were added, as well as chelate complexes and mineral fertilizers.

In this work, the positive effect of the introduction of drugs is experimentally established, which is expressed in the intensification of the growth of green mass and an increase in plant resistance to pollution and stress, from the use of a hybrid biological product. To accelerate the transfer of heavy metals from soil to plants, a potassium complex of oxyethylene diphosphonic acid (hereinafter referred to as K2НЕDP) has been proposed. For the growth of green mass, the following were also used: nitrogen-phosphorus-potassium fertilizers (hereinafter ‒ NPK), mineral fertilizer "Iron Chelate" (hereinafter ‒ Fe-chelate), the drug "Kornevin", the drug "Zavyaz", disodium salt of ethylenediaminetetraacetic acid (hereinafter ‒ Trilon B).

The results obtained allow us to note the positive effect of the joint introduction of NPK, K2НЕDP, "Kornevin", "Zavyaz", "Fe-chelate" additives, and the combined addition of NPK, K2НЕDP, "Kornevin", and "Zavyaz" to plant growth and development despite the presence of excessive concentrations of heavy metals (there is an increase in the growth of *Trifolium repens L*. by 14% in comparison with the control sample). The addition of Trilon B and NPK had the opposite effect (there is a decrease in the growth of *Trifolium repens L.* by 2% in comparison with the control sample).

The research was carried out with the support of the RCTU project No. 3-2020-039.

Keywords

Heavy metals, phytoextraction, phytoremediation.

Bibliographic list

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