Comparison of phytoremediation potential of three grass species in soil contaminated with zinc

Porównanie potencjału fitoremediacyjnego trzech gatunków traw na glebie zanieczyszczonej cynkiem

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Some of the heavy metals are necessary components for the proper functioning of the plant. However, their content in the soil should not exceed certain values, because their excessive accumulation in plants causes disturbances in yielding and plant development.

The experiment was conducted in four replications in pots containing 2.0 kg of soil contaminated with three doses of Zn – 200, 400 i 600 mg·kg^{-1}. Three different species of grass were employed as the test plants: *Poa pratensis L.*, *Lolium perenne L.*,*Festuca rubra L.* After two months the aerial parts of plants were harvested. The roots were dug up, brushed off from the remaining soil and washed with distilled water. All parts of the plants were dried and weighed to determine the biomass. The zinc content was determined in samples of aerial parts, roots and soil samples.

All used doses of zinc have had a negative effect on the biomass of roots and aerial parts of grasses. The yield of tested plants decreased with increasing doses of zinc. The roots were more sensitive to the toxic effects of zinc than aerial parts of plants.

Analysis of the yield and the content of zinc in plant tissues showed that the most tolerant grass was Lolium perenne, for which the yield of the aerial part decreased only by 30% at the highest dose of zinc. The largest decrease in biomass of aerial parts was seen in Poa pratensis, which turned out to be the least tolerant species.