

Utjecaj kadmija na distribuciju molibdena u ozimoj pšenici

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Sažetak

Cilj rada je ispitati utjecaj kontaminacija tla Cd na usvajanje i distribuciju Mo u ozimoj pšenici. Pokus je postavljen u posude po planu potpuno slučajnog blok sustava s deset sorata ozime pšenice i tri razine kontaminacije tla Cd (0, 2 i 5 mg Cd kg⁻¹ tla) u četiri ponavljanja. Uzorkovanje je provedeno u fazi cvatnje (stabljika, listovi, list zastavičar i klas) i u punoj zriobi (slama, listovi, pljevice i zrno). Statistička analiza napravljena je u programu SAS 9.3. U fazi cvatnje najviša koncentracija Mo utvrđena je u stabljici na svim razinama kontaminacije tla, dok je najniža koncentracija utvrđena u listovima pri kontaminaciji s 0 i 2, te u listu zastavičaru pri 5 mg Cd kg⁻¹ tla. U zriobi najviša koncentracija Mo utvrđena je u zrnu, a najniža u pljevicama pri svim razinama kontaminacije tla. Rezultati Kruskal-Wallis ANOVE ukazuju na značajne razlike u prosječnim vrijednostima rangova između razina kontaminacije tla samo za list zastavičar (P = 0,001) i klas (P = 0,012). U cvatnji polovina ukupno usvojenog Mo (53, 43 i 52% na 0, 2 i 5 mg Cd kg⁻¹ tla) akumulirana je u stabljici, dok je u punoj zriobi najviše Mo akumulirano u zrnu (62, 66 i 69% od ukupno usvojene količine na 0, 2 i 5 mg Cd kg⁻¹ tla). Ispitivane sorte pšenice razlikuju se po koncentraciji i sadržaju Mo u listu zastavičaru i klasu na svim razinama kontaminacije tla, dok za koncentraciju i sadržaj Mo u zrnu nisu utvrđene razlike. Prema tome ne može se zaključiti da Cd utječe na akumulaciju Mo u zrno pšenice.

Ključne riječi: molibden, kadmij, ozima pšenica, usvajanje, distribucija

Cadmium influence on molybdenum distribution in winter wheat

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Summary

The aim of this paper was to determine how soil Cd contamination influences on uptake and distribution of Mo in winter wheat. Pot experiment was set up as completely randomized block design with three levels of soil Cd contamination (0, 2 and 5 mg Cd kg⁻¹ soil), ten winter wheat genotypes and four replicates. Samples were taken in flowering stage (stem, leaves, flag leaf and spike) and in full maturity (straw, leaves, glumes and grain). Statistical analysis was done in SAS 9.3. In flowering stage the highest average Mo concentration was measured in stem at all levels of contamination while lowest Mo concentration was in leaves at 0 and 2 and in flag leaf at 5 mg Cd kg⁻¹. In full maturity the highest Mo concentration was found in grain and lowest in glumes at all levels of soil contamination. Kruskal-Wallis ANOVA obtained significant differences in mean scores of Mo concentration between levels of soil contamination only for flag leaf ($P = 0.001$) and spike ($P = 0.012$). About half of total plant Mo (53, 43 and 52% at 0, 2 and 5 mg Cd kg⁻¹ soil respectively) was stored in stem in flowering stage. In full maturity the biggest storage of Mo was in grain (62, 66 and 69% of total Mo at 0, 2 and 5 mg Cd kg⁻¹ soil respectively). Genotypes differ significantly in Mo concentration and content in flag leaf and spike. Genotypic difference in Mo grain concentration and content failed to give sufficient evidence, so we cannot conclude that soil Cd contamination influences accumulation of Mo in grain.

Key words: molybdenum, cadmium, winter wheat, uptake, distribution