

FACTORS AFFECTING MOBILITY OF ZINC IN SOILS OF UKRAINE

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Received July 2020; Accepted August 2020; Published September 2020;

DOI: <https://doi.org/10.31407/ijeess10.402>

ABSTRACT

Zinc (Zn) deficiency is the most common problem of micronutrient deficiency on our planet. This problem is also relevant for Ukraine, as soils are insufficiently provided with Zn, plants are deficient, respectively, and insufficient quantity of Zn is contained in food, which leads to human diseases. Our research showed that the total zinc content in soils increased from the north to the south of Ukraine (Polissya < Forest-Steppe < Steppe): in sod-podzolic soil the Zn content was 40 mg kg⁻¹, in dark gray podzolic - 45 mg kg⁻¹, chernozem typical - 48 mg kg⁻¹, chernozem ordinary - 58 mg kg⁻¹, dark chestnut - 70 mg kg⁻¹. The content of Zn mobile forms, on the contrary, was subject to inverse dependence - the highest level was observed in the soils of Polissya - 9.5 mg kg⁻¹, the lowest in the soils of Steppe - 0.5 mg kg⁻¹. Zn was more firmly fixed by the soils of chernozem-type, higher mobility was observed in soils with pronounced podzolic processes. Zn mobility depended from the properties of soil: pH of the soil solution, the amount of organic matter and clay minerals. Zn mobility increased with increasing soil acidity, increasing the amount of organic matter and clay fraction. There was a close inverse correlation between these indicators and Zn mobility: the pairwise correlation coefficients (r) ranged from - 0.861 to - 0.991. Agrotechnological methods of winter wheat growing reduced the quantity of potentially mobile Zn compounds in the soils of Polissya, Forest-Steppe and Steppe of Ukraine in compared to the natural background. However, mineral and organic fertilizers mainly increased their content, as well as intensified the transfer of Zn from the soil to wheat plants, as evidenced by the biological absorption coefficients which were > 1.

Keywords: agrochemical parameters, mobility, soil, climatic zones, zinc.