



Heavy Metal Contents of Soils, Durum and Bread Wheats in Harran Plain, Southeast Turkey

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Soils are vital for regulating the biological effects and mobility of metals in nature. Iron and zinc are some of the essential nutrients for plants and animals, while other metals are potentially toxic such as lead and cadmium. Toxic heavy metals (HMs) can be taken up easily by organisms. HMs inputs to soil via the application of metal-contained fertilizers often exceed outputs in crops and drainage waters, thus toxic HMs content in many agricultural soils tends to be gradually increasing. Thus adverse human health effects due to soil–plant and plant–human transfer of HMs have been enhanced. HMs may cause harmful effects on human health due to the ingestion of food grain grown in soils.

The objectives of this study were (1) to understand the chemistry of metals in soils for managing their agricultural and ecological impacts, (2) to identify metal uptakes of different genotypes of wheat. Concentrations of HMs (Cd, Zn, Ni, Mn, Cu, Mo, Pb) in wheat were investigated in different agricultural areas in Southeast, Turkey. The results showed that concentrations of HMs were in following order: Mn>Ni>Zn>Cu>Pb>Mo>Cd in surface and next to surface soil and Mn>Zn>Cu>Pb> Ni>Mo>Cd in wheat, respectively. HMs concentrations of several soil samples exceeded the permissible limits of Europe standard except for Ni and Mn. In addition, concentration of Cd, Zn, Cu, and Pb were higher in bread wheat than in durum wheat; however, concentration of Mn, Ni and Mo were higher in durum wheat than in bread wheat.

Unusual amount of heavy metals found in some fertilizers used in the Southeast region of Turkey, it becomes an important subject to determine the amount of metals added to the soil every year. Heavy metals uptake by plants still remains to be an interest for researchers. As the heavy metals contents of plants were below the threshold levels, we conclude that the quality of wheat is high and it should receive attention in national and international markets.

Keywords: Heavy Metals (HMs), Soil, Durum and Bread Wheat, Fertilizers.