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Unconventional Soil Tilling Systems – Influencing Factor for the Content of Heavy Metals in the Soil

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SUMMARY

The different content of heavy metals measured in the soil and in the plant in the historically polluted area of Zlatna, in the years 2009 and 2010, confirms the influence of various factors, among which the way the tillable soil is tilled.

After two years of different systems of soil tilling, plowing, paraplow tilling and disc harrow tilling, different values of Pb, Cu and Zn have been obtained in the maize plants and in the soil (Table 1).

Tab. 1

The content of heavy metals in the soil

Soil tilling system	Heavy metals in the soil (ppm)					
	Pb		Cu		Zn	
	Initial 2009	Final 2010	Initial 2009	Final 2010	Initial 2009	Final 2010
Classic (with plowing)	65	50	16.9	14.2	2.5	2.0
Paraplow tilling	65	59	16.9	13.8	2.5	1.8
Disc harrow tilling	65	42	16.9	16.0	2.5	1.6

The influence of the tilling systems can be mainly explained by modifying the physical state of the soil and the influence of the mulch layer at the surface of the ground on the biological activity in the soil.The content of heavy metals in the soil has decreased with 18.47 % for Pb, 13.02 % for Cu and 28.0 % for Zn after two years of soil tilling.

The heavy metal content in the plant is not correlated to the decrease of soil pollution.

REFERENCES

1. Barriquelo, M.F., Lenzi, E. (2001). Distribution and adsorption of lead by maize plants cultivated in biosolid treated soil, Acta Scientarium, 23 (6): 1319-1324.
2. Damian F., Damian G., Lăcătuşu R., Iepure G. (2008). Heavy metals concentration of the soils around Zlatna and Copşa Mică smelters Romania, Carpath. J. of Earth and Environmental Science, vol 3 (2): 65-82.
3. Guş P.(2004). Researches concerning the pollution effect and the ecological reconstruction of polluted soils from Zlatna area. In 2nd International Conference – Environmental Engineering and Management Journal, vol. 3, no. 3, pag. 497-502, Universitatea Tehnică Gh. Asachi, Iaşi.
4. Lăcătuşu Radu (2006). Agrochimie, Editura Terra Nostra, Iaşi
5. Vrânceanu N.O, Dumitru M., Motelică D.M., Gameț E.(2010). Comportarea unor metale în sistemul sol-plantă, Editura Solness Timişoara.