**Mercury content in agricultural soils (Vojvodina Province, R. Serbia)**

Jordana Ninkov1, Jovica Vasin1, Stanko Milić1, Petar Sekulic1, Jelena Marinkovic1, Srdjan Seremesic2

1 Institute of Field and Vegetable Crops, Maksim Gorki St. 30, 21000 Novi Sad, R. Serbia, [jordana.ninkov@nsseme.com](mailto:jordana.ninkov@nsseme.com); [jovica.vasin@nsseme.com](mailto:jovica.vasin@nsseme.com); [stanko.milic@nsseme.com](mailto:stanko.milic@nsseme.com); petar.[sekulic@nsseme.com](mailto:sekulic@nsseme.com); jelena.marinkovic@nsseme.com

2 University of Novi Sad, Faculty of Agriculture, Dositej Obradovic Sq. 8, 21000 Novi Sad, R. Serbia, srdjan@polj.uns.ac.rs

The Vojvodina Province in northern Serbia is known for its intensive field crops production. Over 90% of total arrable land, which represents more than 1,500.000 ha, is used for field or vegetable crops production. A grid superimposed on a soil map of Vojvodina (R = 1:50.000) by means of a GIS tool GIS ArcView 10 has divided the agricultural land of the Province into 4 x 4 km units, each representing an area of 1,600 ha. Total number of 1,370 bulked soil samples were taken (0-30 cm depth) and analyzed for total mercury content. The samples were analyzed using Direct Mercury Analyzer DMA 80 Milestone, which combines the techniques of thermal decomposition, catalytic conversion, amalgamation, and atomic absorption spectrophotometry. Quality control was periodically carried out with IRMM BCR reference materials 143R and deviations were within ± 5% of the certified values. The aim of this study was to determine the total content of Hg in agricultural soils and its spatial distributions in different parts of Vojvodina Province. Content of Hg in all tested samples was below treshold of 2 mg/kg (which is the maximum allowable concentration MAC) for agricultural soils as prescribed by the laws of the Republic of Serbia. The obtained results were within interval 0.008–0.974 mg/kg. The obtained results also indicated that the measured levels of Hg in the soil are not limiting factors for production of safe food in Vojvodina. The majority of present results were within intervals 0.025–0.05 and 0.05–0.075 mg/kg, 704 and 369 of total 1,370 samples, respectively. Same as with other heavy metals, the content and distribution of Hg in soil depend to a large extent on the parent material from which these soils had developed. Lithogenic elements are associated either with primary minerals, or with secondary minerals (mainly clay minerals). Content of Hg coincides with main geomorphological units of Vojvodina Province. The low concentration Hg below 0.025 mg/kg occupies sandy terrain. The concentration of mercury within interval 0.025–0.05 mg/kg occupies loess plateau and within interval 0.05–0.075 loess terraces. The concentration of mercury above 0.075 mg/kg occupies alluvial plains area of three main rivers in Vojvodina Province. Spatial distribution of the obtained results confirmed that Hg concentration is higher in heavy soils, i.e. with higher clay content. Also, Hg spatial distribution confirmed that most of Vojvodina Province area has geochemical orgin of Hg. Higher concentration Hg on alluvial plains indicated that the origin of Hg near rivers might be from anthropogenic source. This paper presents the results of the research within the national project no. TR31072.

**Keywords:** soil, mercury, heavy metals, Vojvodina Province