

Acronym: HEAVY METALS IN SOILS AND CROPS
Name: Soil chemical properties impact on heavy metals availability and concentrations in field crops
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Partners

Organisation name	Country
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Short description of project

Description: One of the aims of this project is the study of liming on soil fertility, crop yield and quality as well as investigating the movement of heavy metals into the food chain. Research plan includes ongoing experiments with combination of liming and mineral fertilization which have been conducted for 4 years on two sites. Besides continuation of these experiments, new ones will be established on 4 more sites in east Croatia including liming and organic fertilization. During 5 years of the experiments, the analysed soil properties will be: acidity, organic matter, availability of P, K micronutrients (Fe, Mn, Zn, Cu, Ni, Mo) and harmful elements (Cd, Co, Cr, Pb, Hg). Including soil data and by analysing plant material, measuring crop yield and agricultural

production, the removal and transfer of the same elements will be determined. The analysis of wheat, and maize will be conducted, with regard to accumulation of micronutrients and harmful elements in grains.

The Hungarian partner has 2 ongoing field experiments with heavy metal contamination that have been set up in 1991 and 1995. These experiments investigate of 13 elements in soils and plants (Al, As, Cd, Cr, Cu, Ba, Hg, Mo, Ni, Pb, Se, Sr, Zn). There is also an experiment on the effect of liming and fertilizers on acidic sandy soil. The data and results of these experiments will be evaluated with the data of the Croatian experiments.

Short description of the task performed by Croatian partner

Assignments for Faculty of Agriculture in Osijek:

- conducting field experiments with liming and fertilization treatments

- sampling soil and plant material

- analysing nutrient and heavy metals content (AA and ICP-OES)

- scientific meetings participation and scientific papers publishing

Direct results of scientific co-work will be scientific papers in journals and conferences proceedings. The two involved labs (RISSAC, Budapest and Faculty of Agriculture in Osijek) will have new experience and possibility of analyses comparison, results interpretations and soil remediation recommendations. The Croatian lab expect to improve ICP-OES analytical method of soil and plant samples.

Application of the planned research results can be expected in scientific and production terms:

Project task:

1. Results of the nutrient uptake and translocation, especially micronutrients and harmful elements could be used in choosing a most suitable crop for production on a specific soil types and for a specific production systems (organic or mineral fertilization).

2. Results of the liming and fertilization efficiency with regard to soil characteristics will be used for improving already existing computer programs for developing basic fertilization recommendations on the grounds of the results of soil analyses, but also for recommending soil conditioning measures with the goal of optimal micronutrient concentration and minimal harmful elements concentration in grain.

3. Results of the heavy metal loading long-term field experiment may help to assess the soil contamination works as well as the environmental authorities control.