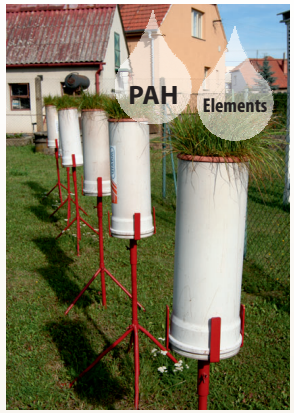
Active biomonitoring

Atmospheric deposition can pose a risk of increasing content of risk elements and substances in agricultural crops. Active biomonitoring is one of the methods for evaluation of an up to date risk of an atmospheric deposition effect. This method consists in exposition of pre-grown plants in an interest area and observing their reaction. As a bioindicators were selected ryegrass (*Lolium multiflorum*) and pine-tree (*Pinus nigra*).

- elements – Al, As, Be, Cd, Cr, Cu, Fe, Mo, Mn, Ni, Pb, S, V, Zn, Hg
- organic pollutants – PAH



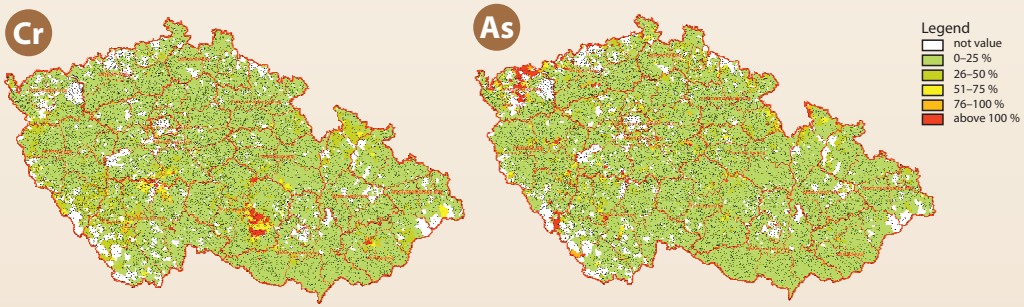
Registry of risk elements contents in agricultural soils

Registry of risk elements contents in agricultural soils is a database of spatial data which is used for characterization of the levels of the risk elements contamination (As, Be, Cd, Co, Cr, Cu, Mo, Ni, Pb, V, Zn, Hg) in agricultural soils.

The core of the database are results of an extensive soil exploration from 1990–1992 and now the database is gradually updated. The contents of potentially risk elements were determined in 2M HNO_3 leach (finished in 2009) and in Aqua Regia mineralisate (started in 1998).

Currently, the database contains more than 60,000 samples. The Registry is a part of LPIS (Land Parcel Information System). Recommendation for farming in contaminated areas are under construction. Maps of the Registry give a basic view of polluted areas in the Czech Republic.

Contents of potentially toxic elements in agricultural soils of the Czech Republic



Cartograms are related to determination in 2M HNO_3
Elements average contents according to cadaster territory expressed as percentage of the maximum permissible value

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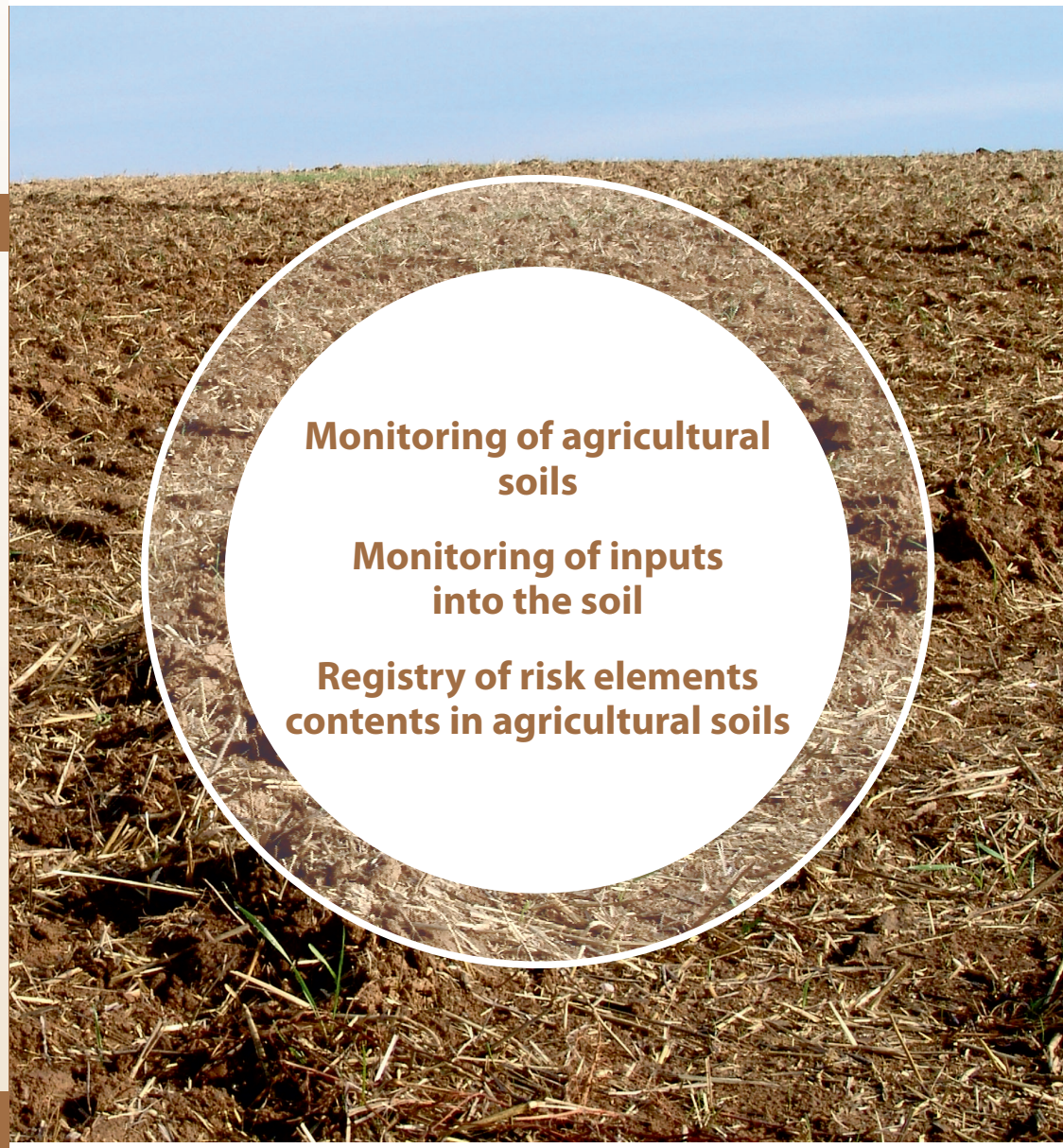
CENTRAL INSTITUTE FOR SUPERVISING AND TESTING IN AGRICULTURE

SOIL SAFETY



Monitoring of agricultural soils

Monitoring of inputs into the soil

Registry of risk elements contents in agricultural soils

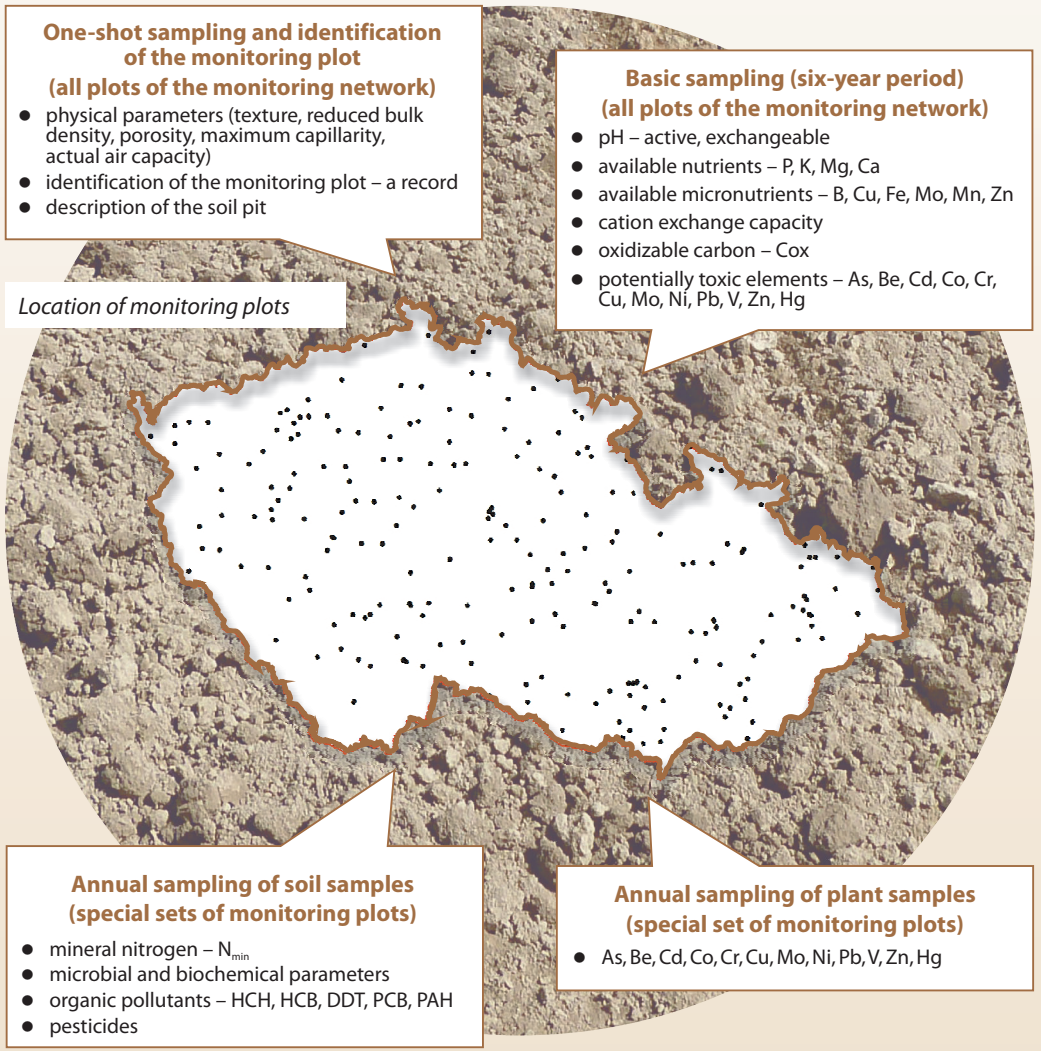
FERTILISERS AND SOIL

Monitoring of agriculture soils

Monitoring of agriculture soils is a system of long-term monitoring of the state and development of the soil quality parameters of agriculture soils on the stable set of monitoring plots. This system is perfomed by Central Institute for Supervising and Testing in Agriculture (ÚKZÚZ) and it is supported by the Ministry of Agriculture. The monitoring system was established in 1992 and consists of 214 monitoring plots.

Monitoring plot:

- area 1,000 m^2 (25 x 40 m)
- exactly defined by geographical coordinates in terrain
- described landscape morphology and soil and climate conditions

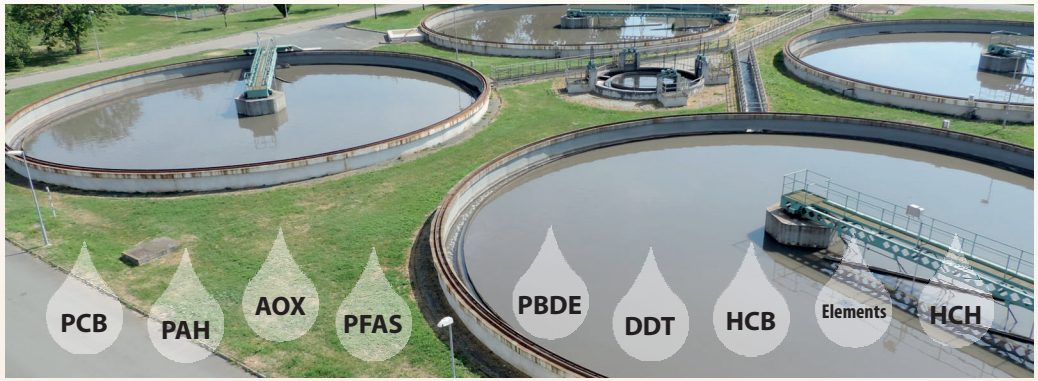


Monitoring of inputs into the soil

Protection of food chain, human health and soil quality is the main reason for observing of materials (and their quality) which input into agricultural soils.

Monitoring of the sewage sludge quality

Monitoring of the sewage sludges is focused on these waste water treatment plants whose products are supposed to be applied on agricultural soil. Samples are taken from about 80 waste water treatment plants.



- potentially toxic elements – As, Cd, Cr, Cu, Mo, Ni, Pb, V, Zn, Hg
- organic pollutants – PCB, PAH, AOX, PFAS, PBDE, DDT, HCB, HCH
- moisture
- pH

Monitoring of the river and lake sediments

ÚKZÚZ monitores the quality of the sediments generally, especially from emptied reservoirs. The sediments can be applied on agricultural soil in case of performing of legally prescribed conditions. Twenty samples are collected each year.

- exchangeable pH
- available nutrients – P, K, Mg, Ca
- potentially toxic elements – As, Be, Cd, Cr, Cu, Mo, Ni, Pb, V, Zn, Hg
- organic pollutants – C_{10}–C_{40}, PCB, PAH, DDT, HCB, HCH
- texture