

Exploiting solid phase extraction in a sequential injection system for phosphate determination in fertilized soil leachates

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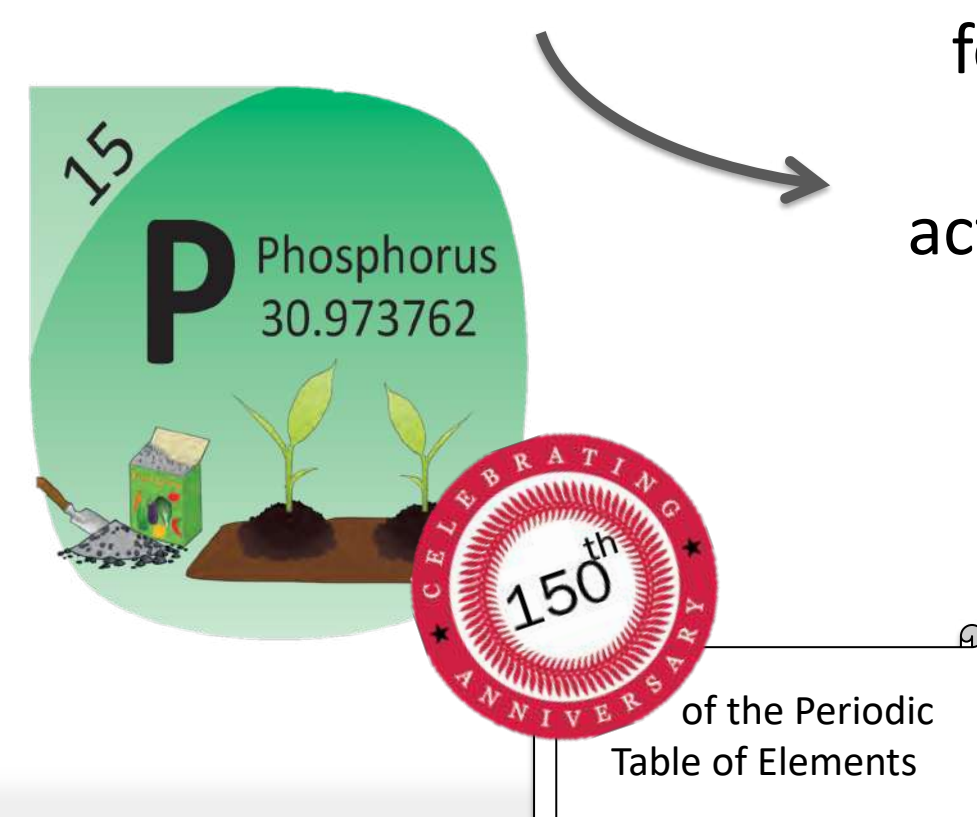
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Introduction & Aim

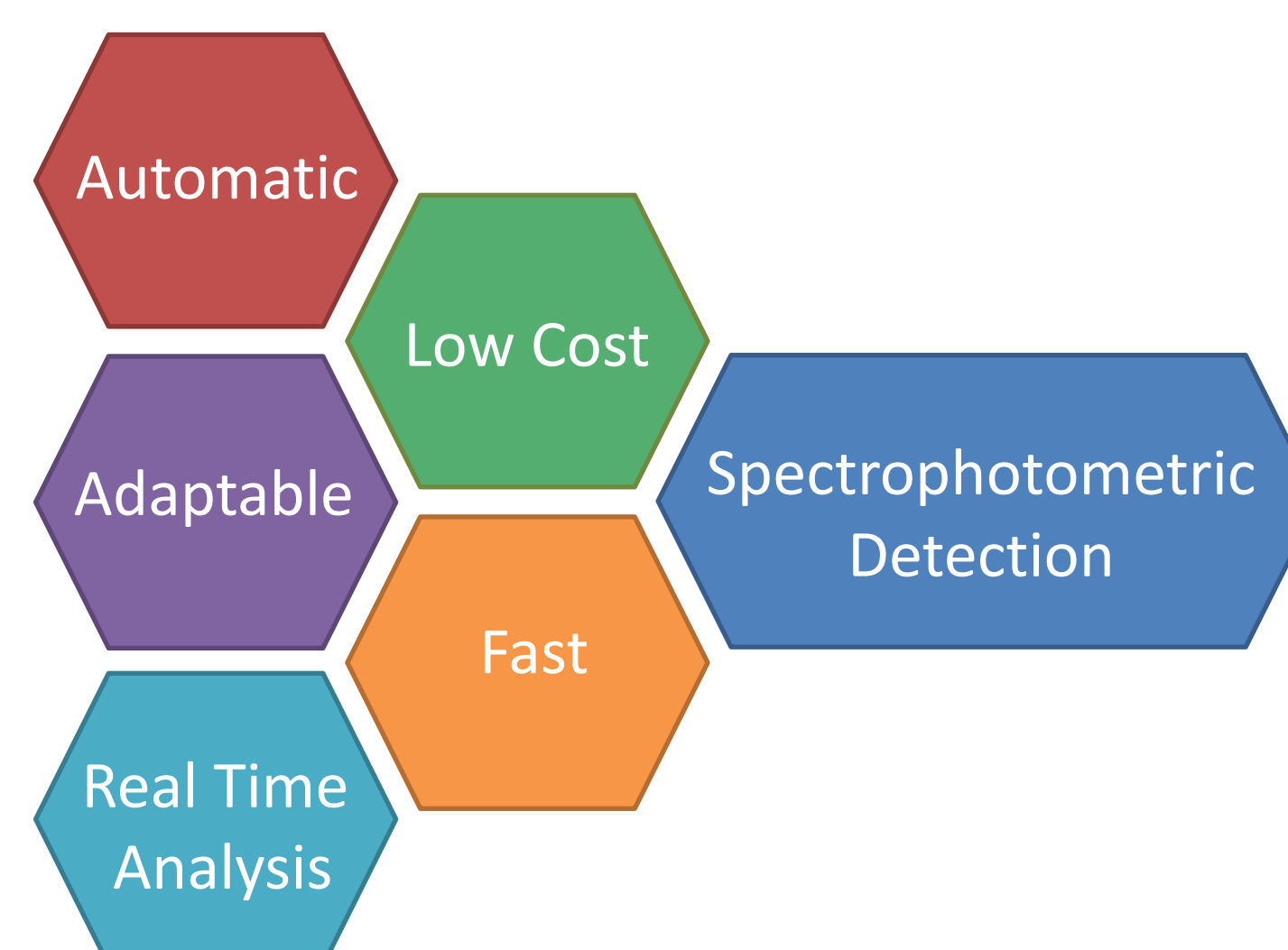
Phosphate



The inorganic phosphate derived from fertilizers, intensively used in agricultural activities, is often found in excess in ground waters.



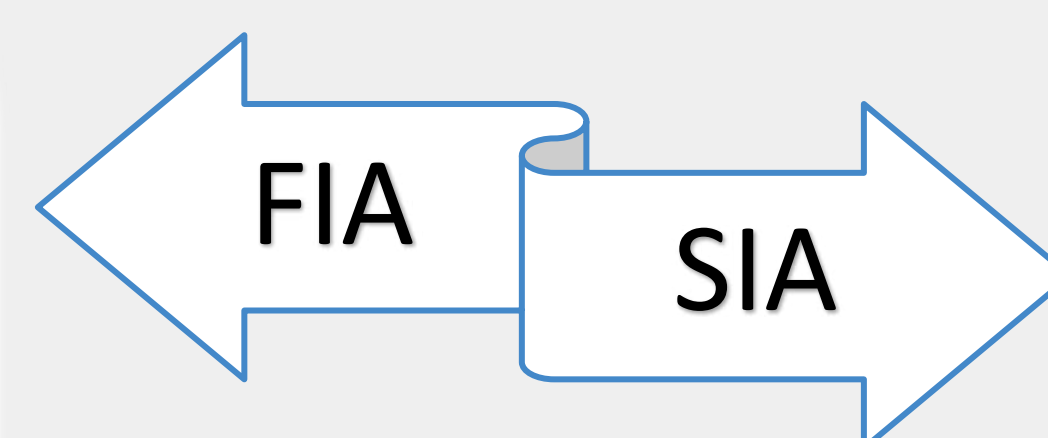
Monitorization of soil leachates is very important



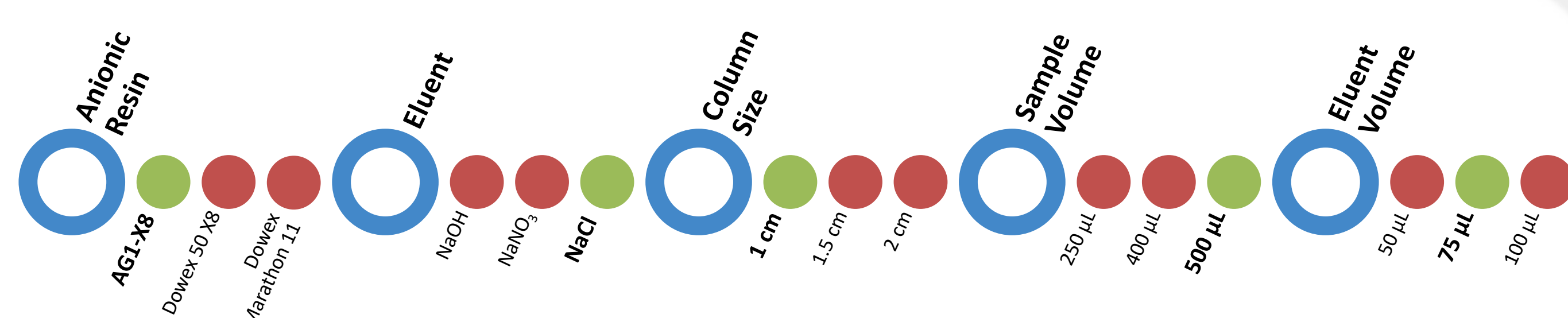
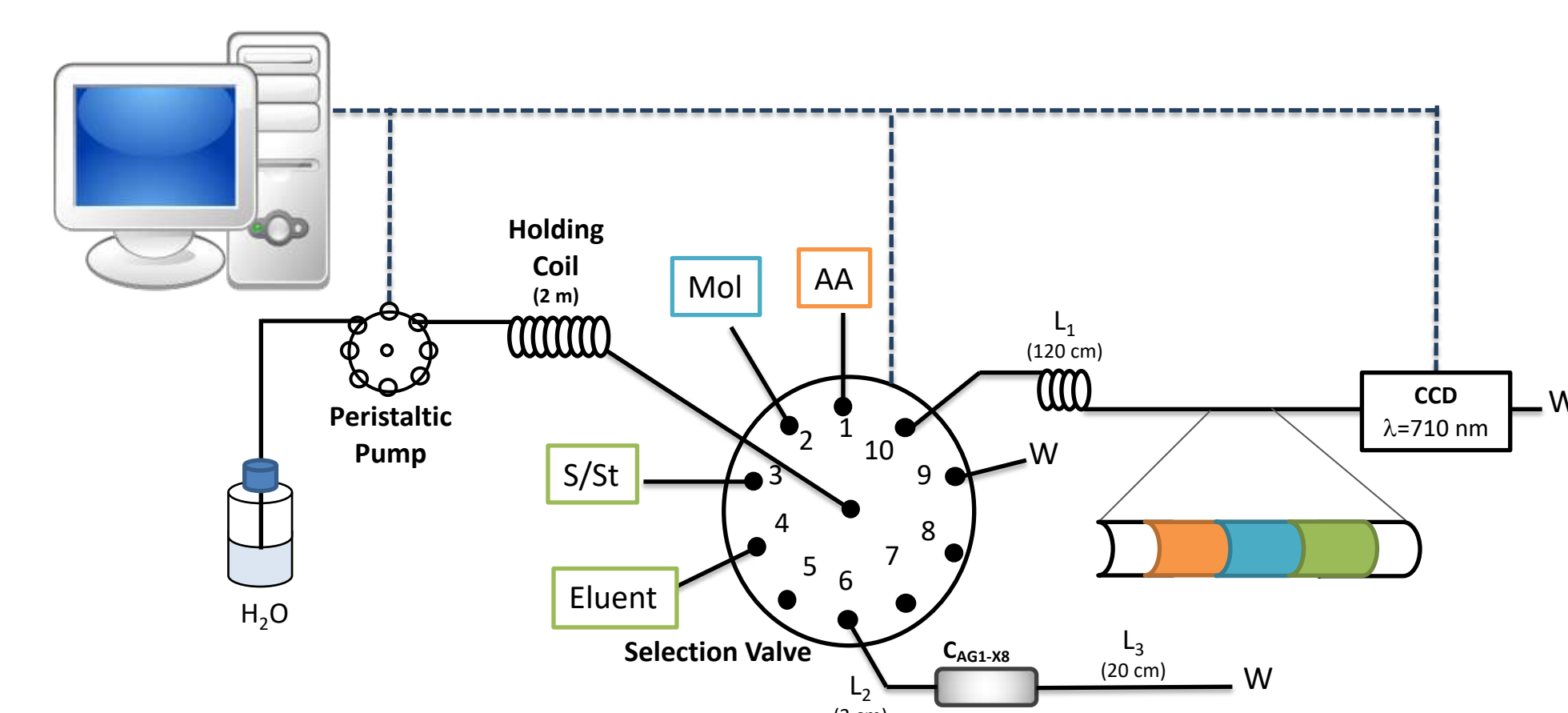
Flow Analysis Systems:

Flow Injection Analysis
Sequential Injection Analysis

Methods

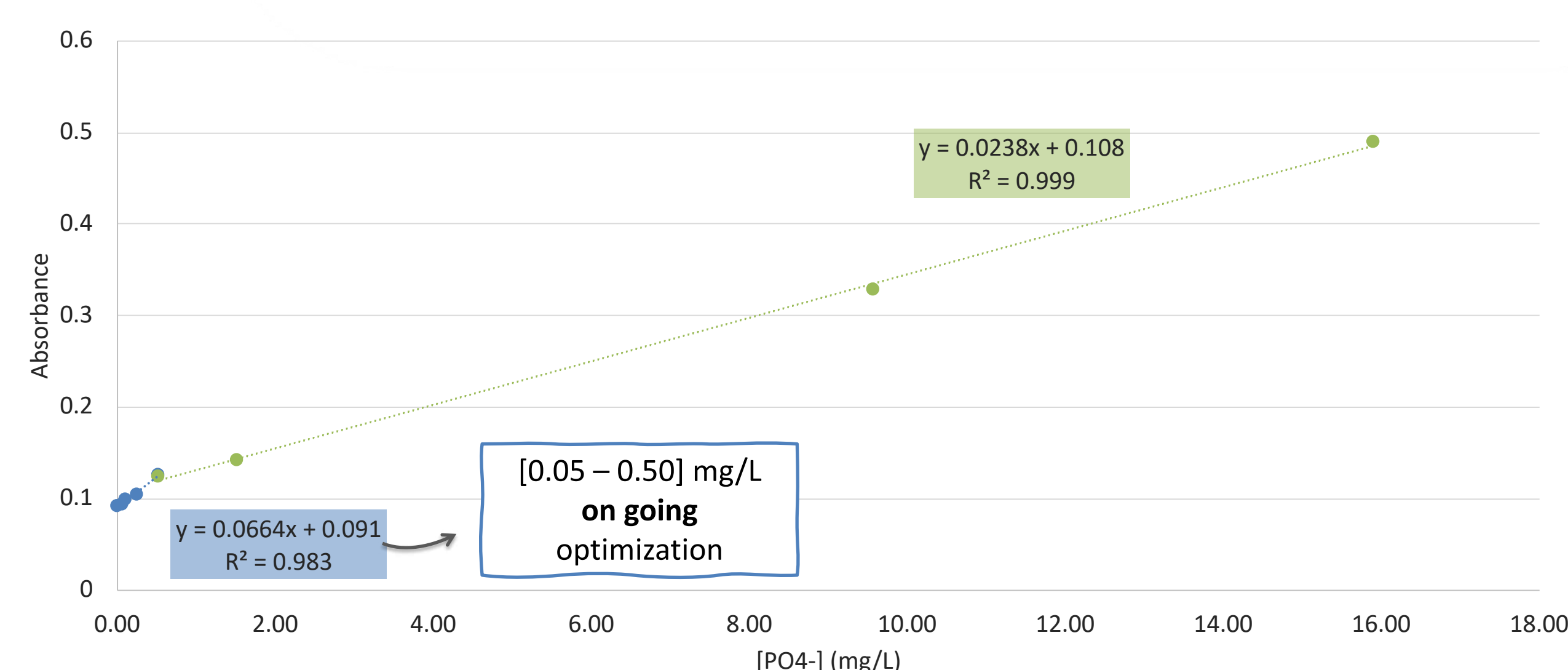
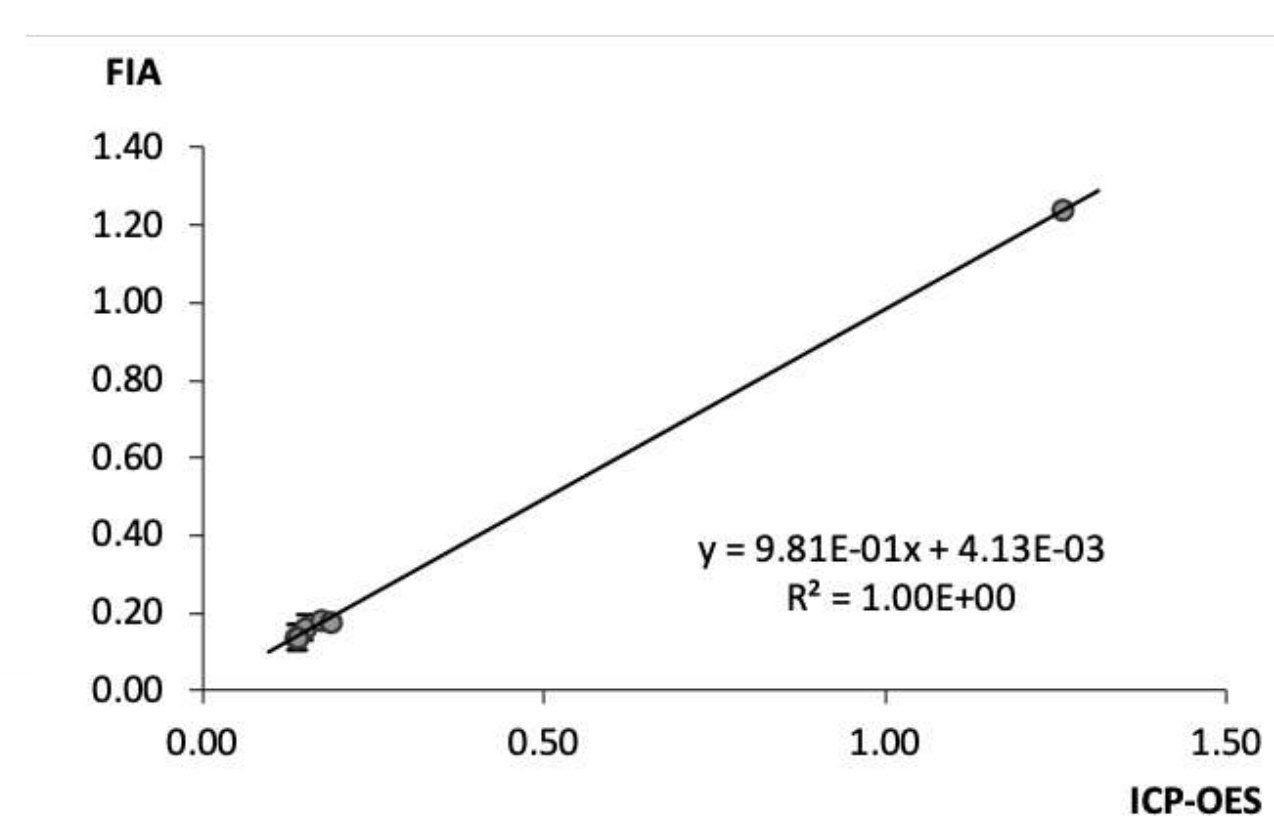
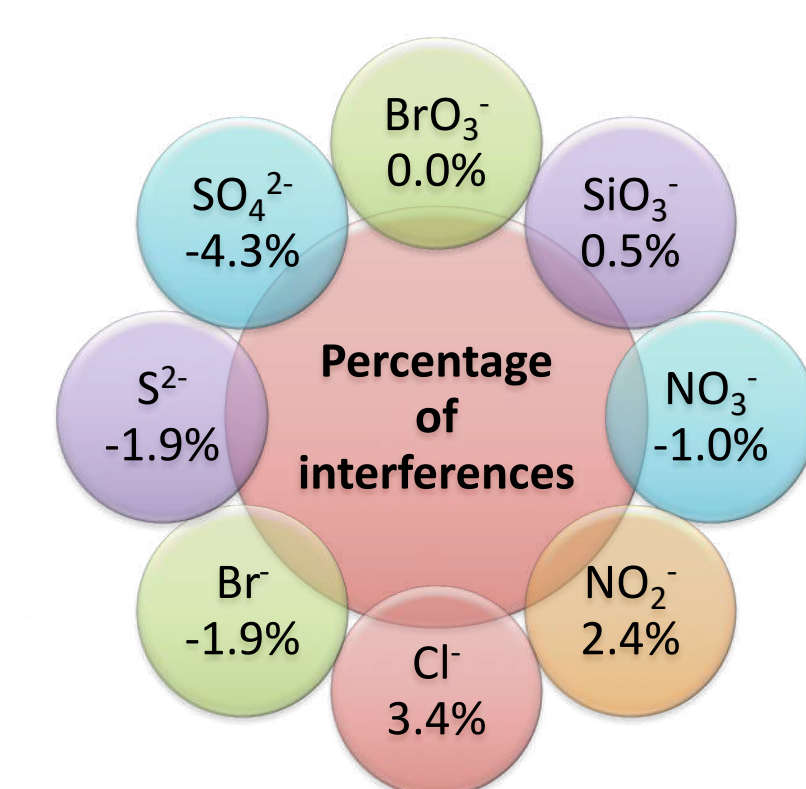


AA, Ascorbic Acid 30 g/L;
Mol, Molybdate reagent 16 g/L;
S/St, sample / PO_4^{3-} standard;
Eluent, NaCl 0.5 M;
CAG1-X8, column packed with AG1-X8 anionic resin;
W, waste

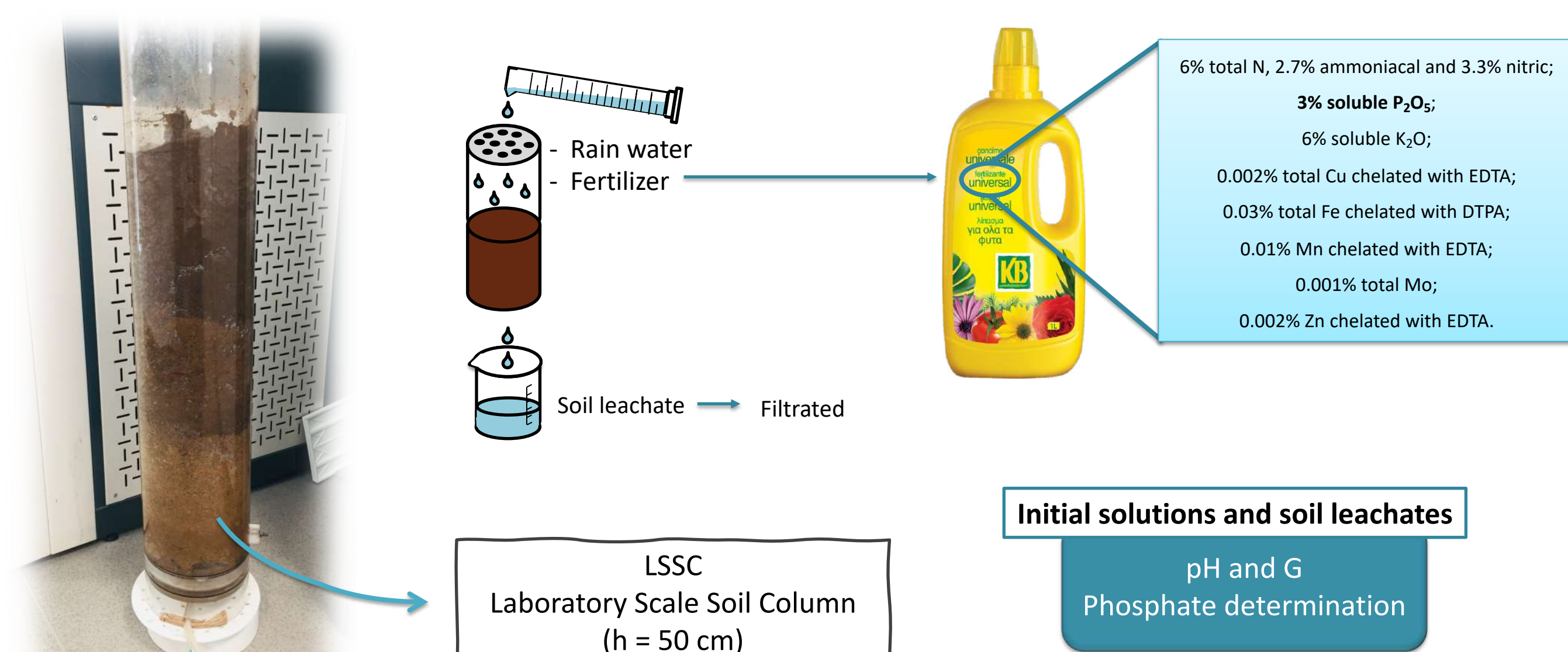


Analyte	Dynamic range (mg/L)	Calibration curve* $A = S \times [\text{PO}_4^{3-}] + b$	LOD (mg/L)	LOQ (mg/L)	Determination rate (h^{-1})
PO_4^{3-}	0.25 - 5.0	$y = 2.52 \times 10^{-3} (\pm 4.95 \times 10^{-3}) \times [\text{PO}_4^{3-}] + 7.81 \times 10^{-2} (\pm 3.54 \times 10^{-2})$ $R^2 = 0.999$	0.20	0.66	40

* n=3



Samples



The developed FIA and SIA are **automatic and low cost** capable of **real-time monitoring** of the soil leachates

The developed systems can be applied to different water samples: river water, sea water, estuary water, well water, **rain water**; **fertilizer and soil leachates**

Conclusions

The main **interferences** of the phosphate determination were **eliminated** by the use of the AG1-X8 resin column

The developed **SIA** allows the phosphate determination in a **lower concentration range** and uses significantly **less amount of reagents**, therefore producing **less effluents**

Acknowledgements

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