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METHODS USED FOR HEAVY METAL DETERMINATION IN AGRICULTURAL INPUTS

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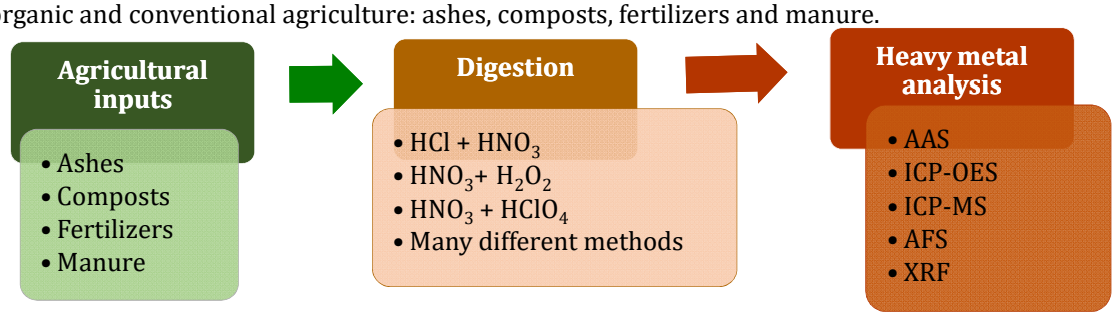
Abstract: *Lately, organic farming has become a big part of the economy, and its importance is constantly growing. Since the organic farming is subject to a number of restrictions, not all agricultural inputs used in conventional agriculture can be used. Focusing on environment and human health protection, a number of inputs have been studied for acceptance in organic farming. Some of the most used inputs are ashes, composts, certain mineral fertilizers and manure. Heavy metals are one of the most common contaminants in these materials. Their quantitative analysis and correlation with current legislation should be one of the key factors in approving their use. This paper presents a list of methods used for heavy metals analysis in different matrices, found in recent studies.*

• Introduction

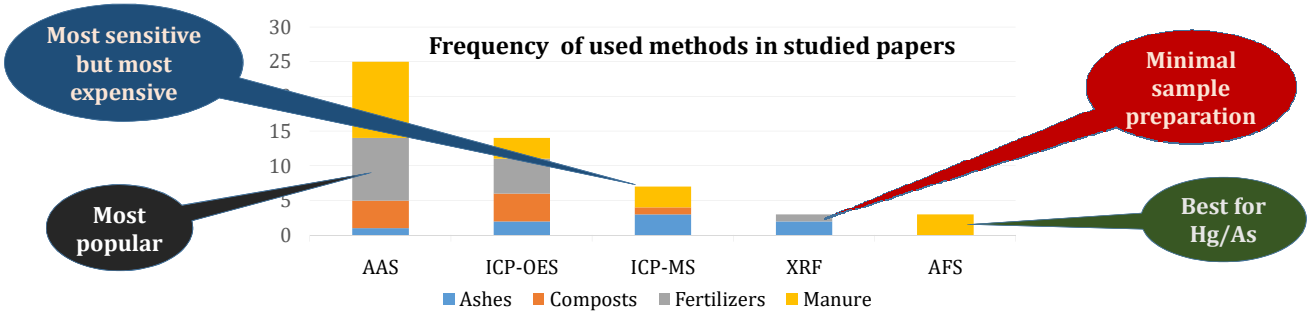
Different analytical methods can be used for determination of heavy metals, each with its advantages and disadvantages. Although the total concentrations of heavy metals offer incomplete information about potentially plant-available fractions, they provide a helpful indicator that shows if a sample has high or low concentrations.

• Material and method

This paper aims to review the methods applied for determination of heavy metals for some of the most used inputs in both organic and conventional agriculture: ashes, composts, fertilizers and manure.



Since there are no regulations regarding both the sample preparation and heavy metal determination for this type of samples, each study uses its own version derived from standard methodology of different matrixes. Regarding the studied papers, the figure below shows the frequency of used methods.



• Conclusions

- This paper provides an overview of the most used and sensitive analytical methods used for heavy metal quantification. The selection of the most reliable and accurate method is an important step which is always connected with chemist's knowledge and skills.
- Because European legislation do not impose some specific methodology for heavy metal analysis in agricultural inputs, each country uses various protocols for these determinations. Also, there are no specific range for all metal concentrations, leaving everyone to set their own limits for most of them.
- The methodology for heavy metal analysis is not so varied, and two methods are most often used for these determinations: AAS and ICP (-MS or -OES), for all types of reviewed inputs. Sample preparation, on the other hand is quite different from one user to another.

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