

"Soil analysis: why and where?"

Purpose and aim of this position paper is to inform everyone who could pollute the groundwater, in the exercise of his or her profession as well as of a hobby, such as amateur gardening.

Through their actions, today's gardeners will influence the quality of the water and the plots bequeathed to future generations.

The soil analysis appears to be a useful tool for evaluating the characteristics and the richness of the soil.

Practical recommendations

1. Sampling

The first step concerns taking a specimen sample, a delicate operation the importance of which is not always fully perceived by the gardener.

It is important to have a representative average sample of the plot of land to be analysed. Twenty samples must be taken in a zigzag or crosswise direction so as to constitute an average sample of 500 g which will then be sent to the analysis laboratory.

The depth of the sampling must be from 0 to ± 25 cm, which is the arable layer in the case of vegetable plots, and from 0 to ± 10 cm in the case of already existing plots.

It is not recommended to take soil samples when it is raining.

The sampling should take place before fertiliser use, and at the end of the winter season.

2. Chemical analysis of the soils of vegetable plots

Chemical analysis of the soils has two distinct objectives: either the maintenance of the production levels, by regular control of the soil fertility, or the improvement of the fertility of those plots of land which show abnormalities.

Two groups of chemical analysis are recommended:

2.1. Classic chemical soil analysis

This analysis comprises:

- determination of the pH - KCl which measures the level of acidity or alkalinity of the soil and gives information on the possible need for liming.

Recommended method: potentiometry

- quantitative analysis of the oxidisable carbon (humus) which is an organic matter resulting from the decomposition of vegetable debris by microbial flora and fauna.

The main factor of fertility, the micro-organisms, progressively degrade the organic matter into a more mineral form which will be absorbed by plants.

Recommended method: Walkley and Black method

Redox-potentiometrical titration

- quantitative analysis of chemical elements vital for plant nutrition - quantitative analysis of exchangeable bases, K, Ca, Mg: recommended extractive agent: EDTA ammonium acetate pH 4,65

Recommended method: atomic absorption flame spectrophotometry
- quantitative analysis of exchangeable phosphorus
Recommended method: colorimetry with molybdenum blue

2.2. Analysis of content of nitric nitrogen (nitrates) in the soils of vegetable plots

This analysis comprises:

- extraction of nitrates by KCl
- quantitative analysis of nitric nitrogen

Recommended method: colorimetric method by reduction of the nitrates to nitrites with cadmium sulphate

3. Physical analysis of the soils of vegetable plots

This analysis comprises:

- granulometric analysis to determine the texture of the soil by separating the mineral particles of the soil into clay, silt and sand fractions (rough silt (20 to 50 µm) - fine silt (2 to 20 µm) - clay (0 to 2 µm) - sand (> 50 µm)) Recommended method: sedimentation method - Robinson pipette

4. Interpretation of results

The results of the different analyses become the subject of an analysis report which is subjected to an agronomic interpretation. The agronomist then suggests an answer to the request for information concerning the fertility of the plot of land and recommends a structured plan of fertilisation relative to the use of the land, its history, and all other information relating to it, including the analytical results.

5. Frequency of analysis

Granulometric analysis of the plots of land of allotment gardens need be carried out only once. The object is to characterise the plot of land in terms of its texture.

As for the chemical analyses presented above, it is recommended they be applied once every three years.

6. Average cost of soil analyses of allotment gardens

Analysis type	Price in BEF	Price in ECU
granulometric analysis	500	approx. 12
classical chemical analysispH-P-Ca-Mg-K-humus	500	approx. 12
nitrate analysis	400	approx. 10
Total	1400	approx. 34