Biodiversity.

To evaluate vitality.

The chemical analysis of the compounds present in an organic substance provides information on their nature and their quantity, but is unable to define their vitality.
If, in fact, we consider any organic compound to be the result of the interactions between living organisms, a method of analysis is necessary to enables us to detect their activity, their ability to adapt and evolve.
A solution in this sense is represented by morphological analysis (image-forming method), where the influence of the characteristic formative structures of a particular substance is observed.
This procedure can be considered to be an essential integration to a simple chemical analysis of an organic substance. Based on the scientific studies conducted by Wolfgang Goethe on the shapes of Nature, Rudolf Steiner hypothesised the existence of a formal link between inorganic substances (e.g. crystals) and organic substances (such as plants, soil, fruit, compost, blood, milk, etc...).
Steiner stated that, by mixing an organic substance with an inorganic salt solution, the degree of vitality of the former would result in more or less apparent changes in the shape of the latter.
Following the first experiments performed by Lily Kolisko in the twenties, Steiner's theories on crystallisation were then applied to laboratory procedures by Dr. Ehrenfreid Pfeiffer, who published his first works in the early thirties highlighting the interesting prospects of this type of analysis and describing their methodology. There are also other researches and studies, such as those conducted by O.C. Gruner, W. Krebs, A. Selawry, F. Bessenich and H. Krüger, who confirmed the validity of the procedure and expanded its scientific applications.
Currently three types of image-forming methods are used that analyse precisely, both in terms of quality and quantity, the compounds that make up organic and inorganic matter: *sensitive* copper chloride *crystallisation*, *capillary dynamolysis* and *circular chromatography*.

Sensitive crystallisation
In the method used for sensitive crystallisation, copper chloride (CuCl2), used as a reagent, is dissolved in water and mixed with the organic sample to

be analysed. A certain amount of the solution is then spread onto a glass plate that is placed inside a crystallisation chamber where temperature, moisture and vibration are controlled and kept constant. Within a few hours the solution dries, leaving on the glass plate the shape arising from the interaction between the crystals and the organic matter. In fact, copper chloride in its pure state generally crystallises always in the same way; if, however, it is combined with an organic substance, it takes the shape that this substance imposes on the crystals by reorganizing their growth and orientation on the glass plate. By studying several crystallisations of the same substance and examining the shape and complexity of the crystal weave, we can identify characteristic features, and consequently the degree of vitality and harmony of a specific organic compound as well.

Capillary dynamolysis

Capillary dynamolysis is based on the use of special absorbent chromatographic paper and is carried out in three basic steps.

Once the paper is rolled into a cylinder, it is placed vertically in a dish containing a solution of the organic matter to be analysed. This will be gradually absorbed. After leaving the paper to dry for about two hours, the operation is repeated with a silver nitrate solution that is absorbed up to a centimetre above the level reached by the previous phase.

After a second drying stage, the third and final phase of absorption is carried out with a solution of iron sulphate, up to a height of about 12 cm.

After the final drying stage, the traces left by the two different solutions absorbed will be visible and the images will reflect the influence of the organic substance analysed.

Circular chromatography

To carry out circular chromatography, a technique developed by Pfeiffer, a piece of absorbent chromatographic paper is placed horizontally and soaked in a solution of silver nitrate (AgNO3), and then dried.

A solution of the organic substance to be analysed is then placed at the centre of the sheet.

As the solution is absorbed radially from the centre, it leaves a precise image that corresponds to the type of compound analysed and to the unique characteristics of the sample.

The information gleaned from these techniques is vast: for example, if a soil sample is analysed, the percentage of organic matter, of inorganic matter, the level of aeration, biological activity and the interactions between these aspects can be determined.

If the soil is well-balanced, alive and full organisms the result is a complex but harmonious and lively image; on the other hand, the image will be uniform, undifferentiated and faded if the soil is so devoid of organic compounds to be reduced to the state of a pure mineral substance.
In agriculture, an analysis that investigates the chemical composition of a sample as well as its formative activity, both quantitatively and qualitatively, is a powerful instrument that allows us to correlate our farming methods and actions to the soil conditions and to the specific needs of every plant.