SOBAC

Pour la Terre, pour longtemps.

SOIL PROFILE UK

SOIL PROFILE

Soil profile made : Erwan ALLAIN, scientist director from SOBAC in the presence of the partner farmer **HUGH,** Charlie Gibbs, director of Agrassure and Corentin Mezy Export Manager from SOBAC.

Date and place : 09/04/2025 – Darbishire Farms – Warwickshire UK

Objective : Perform 2 comparative pits to assess soil characteristics and root state and soil evolution.

Context of the study :

Two pits were appraised, on the same crop (wheat) and two plots a few meters apart with the same geology:
-FOSSE 1: The so-called «Control» pit having received only mineral fertilization.
-FOSSE 2: The pit called «SOBAC 3 years» having received three applications of Bacteriosol at 100kg/ ha each year.

Interpretation point :

- Soil diagnostic / Horizon struturation
- Water management
- Root State
- Link Soil ➔ Plant

FOSSE 1, CONTROL

H1

H2

H3

H4

H5

H1: Brown clayey surface horizon over 12 cm, presence of primary roots. 0-12cm.

H2: Lighter surface clay horizon, less root density but not too much compaction, damp horizon. Roots present. 12-35cm.

H3: Compacted clay horizon with little moisture. No functional roots at this level. Beginning of severe compaction. 35-50cm

H4: Ultra-compact clay horizon, no oxygenation, no roots. Presence of unoxidised iron, so really no access to air. Poorly structured horizon. 50-100cm

H5: Clayey horizon with free water everywhere, saturated with water, end effect, closed horizon, smell of scrap metal, grey horizon. 100cm-110cm

FOSSE 2, SOBAC 3 YEARS

H1: Larger primary brown horizon, much lumpier, the clay is much more aerated, less compaction. Better water management on this first horizon. Mushroom smell, undergrowth. Good root structure. 0-15cm.

H2: Surface clay horizon that is much more confused with H1 compared with the control, horizons are more easily mixed. High root density and no compaction, lumpy clay. Moist horizon with perfect soil structure. It's very colourful because the clay is totally oxidised, and there's excellent aeration of the soil at depth, which is the same as in H3. 15-45cm

H3: Very structured horizon, numerous earthworms present. Horizon completely colonised by roots up to 95cm. Water bound in the clay-humus complex created by bacteriosol. 45-95cm

H4: Clayey horizon that is fairly compacted but less so than H3 on the control, less oxygenation so no roots. Presence of unoxidised iron and free water. We're only in year 3 of use, and the microorganisms will become more and more active as the years go by. 95cm-110cm

PROFILE :

The profiles are just a few metres apart, with identical terroirs and identical growing conditions.Through these 3 profiles, we were able to draw up an interesting report on the behaviour of the soil and the state of the roots.

Visual observations and measurements made on the profiles:Less pronounced horizons on the SOBAC side, with more diffuse transitions showing a mixing of horizons throughout the profile.

At the same time as the soil and horizons are changing, root systems are more deeply developed on the SOBAC side.We can see the cumulative effect of the SOBAC concept with 3 years' hindsight, with the soil being structured at depth, allowing the roots to penetrate more easily and be functional in feeding the crop. The entire 3-year SOBAC profile is colonised by recent functional roots, evenly distributed.
In the Control profile, functional roots can only be found at 0-35 cm. The roots are immersed in an asphyxiated horizon.

A lot of free water saturates the deep horizons. On the SOBAC profile, water management is optimal; there is no saturated zone of free water. This water management is correlated with the deep biological structuring of the horizons through the creation of humus (humus = structuring = bound water retention and drainage of excess water). This water management can also be correlated with the levels of iron oxidation and reduction in the horizons (orange or grey colour).

There is a more regular pH on the SOBAC side, indicating a regulating effect. The more acidic pH on the control side can easily be explained by poor water management, which asphyxiates the horizon over the long term, lowering the pH through anoxic (= oxygen-free) biological and chemical reactions.

Why these findings and measurement results?

Bacteriosol has helped to create humus and regulate the pH through its biological action in the deeper horizons, an action illustrated by the physical structuring of the soil, very good capillarity and pH regulation at a depth of more than 1m10, in just 3 years. This beneficial development limits physiological shocks to the way crops are absorbed by the root system, and promotes smooth, balanced nutrition.

Between the Control soil profile (roots up to 35cm) and the SOBAC profile (roots up to 95cm), we gain 60cm of rooting in just 3 applications of Bacteriosol. This gives the plant access to an extra 6000 m3/ha of soil to collect the water and minerals it needs. T

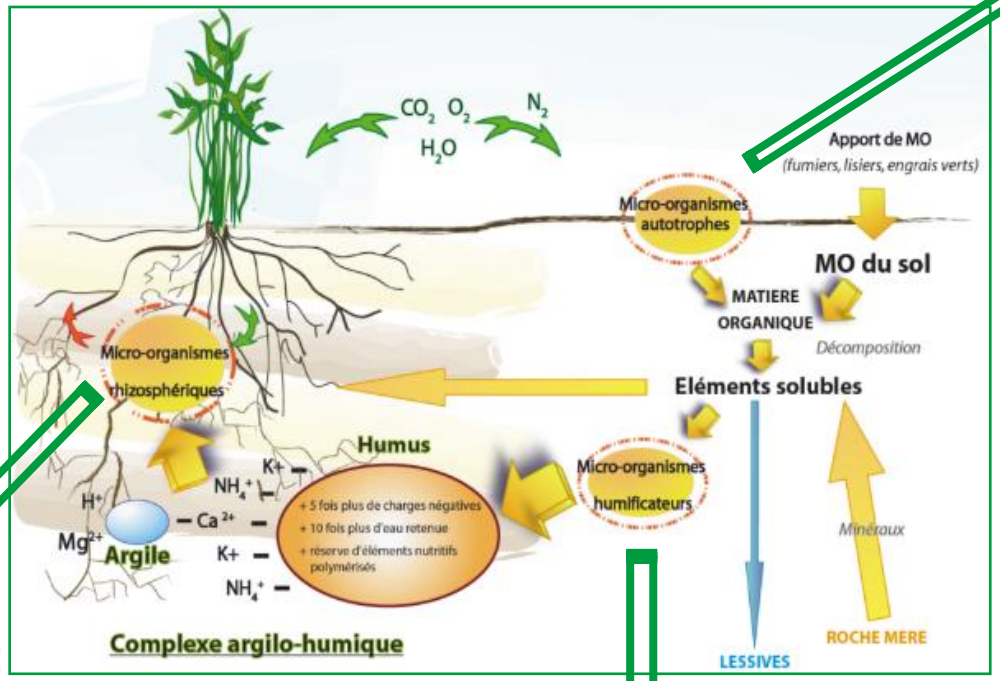
he humus created from the carbon fixed in the air and the transfer of carbon via the plant, stimulated by the activity of the rhizospheric micro-organisms in the Bacteriosol, helped to structure the surface horizons (which are more lumpy) as well as those at depth, enabling :

*Oxygenate the entire profile, making it easier for roots to penetrate deeper into the soil and to explore a larger volume of soil in a more homogeneous and sustainable way. In addition, oxygen is an essential element for root absorption,

*rebalance the soil solution,

*maintain a greater water reserve in bound form, thus avoiding saturation of the soil in winter and dehydration of the underlying horizons in dry periods.

HOW DOES IT WORK?



The **AUTOTROPHIC MICRO ORGANISMS** capture **C and N** of the air **creating organic matter** and enriching the soil in nutritive elements .

The **RHIZOSPHERIC MICRO ORGANISMS,** in symbiosis with the roots, are a real **Carbon trap and enhance the developement of the root system**

The **HUMIC MICRO ORGANISMS** **Transforms** the **organic matter** into **humus,** which is a stable for or organic matter in the soil

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