

AGRICULTURAL TRAINING

THE SOIL TABLE

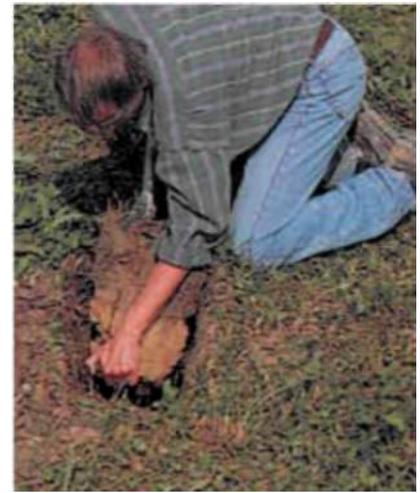
This is just an example of a practical exercise in agricultural training. You can make other tables according to your farming characteristics.

Foreword

The soil is not just ground to tread on or to be manipulate as we like. It's a living entity which is born, grows, reach its maturity and, if misused, can even die. Therefore a close and experiential observation of it is necessary to test his health and learn the complexity of elements, organisms, events and actions which influence its conditions.

It is possible to test the nature, state and the quality of a cultivable soil in an easy way with the *spade analysis*. By observing humidity, smell and color you can understand its nature, needs and dangers.

The spade analysis



- 1) Dig a hole planting vertically a 45 cm. spade in order to reach the not worked layer of the soil. While digging you can make the first observations: do you feel a strong or a weak resistance? How does the extracted earth break into pieces? You can see if the soil is sandy, clayey or slimy. How many earthworms are there? Heartworms are the first and most important sign of the health of the soil.
- 2) From the vertical face of the hole extract a slab of earth about 10 cm thick or less in stony grounds hard to dig.



- a) First test: *humidity*. It tells if you can enter the field on foot or with a machine to work it. Break a clod with the hands: is it hard to break? You can enter the field but you can't cultivate it. Is it friable? The soil is ready to be cultivated, but pay attention to tread on it especially with heavy machines because it is easily constipated. Is it plastic? the earth twists or kneads without breaking: do not enter and do not work it because there are risks of permanent damages.
- b) Second test: *Smell* the clod. It will tell you about the aeration of the soil and decomposition of organic materials. The cultivated layer has a strong smell while the non cultivated one has no smell. A good smell means that the soil is well aerated and organic materials are well decomposed. A bad smell means the soil is bad aerated and the rotting materials indicate that the soil is constipated (asphyxia).
- c) Third test: *Color*. It shows the degree of aeration, its water regimen and humus percentage. Yellow, brown and reddish colors are produced by oxidized iron and its compounds in a well aerated soil. In soils permanently water-saturated, iron takes on a grey-blue color because of a lack of oxygen. Humus adds grey-black shades. In soil like these the growth of roots is limited. In periodically water soaked soils there are rusty stains and brown-black concretions of manganese. According to colors and smell you can see if there is a degradation of the soil structure which hinders the development of plants.



- d) Fourth test: the *nature* of the soil. It is formed by the structure and the percentage of humus. The percentages of sand, silt and clay constitute the texture which can be tested with a tactile test while the percentage of humus can be seen from the more or less dark color of the soil. Usually soils are divided into: light, medium and heavy.

Take a handful of humid earth, press it to form small balls and cylinders. Observe: *adhesion* to fingers, *cohesion* and *plasticity*.

If the earth does not adhere to fingers and is granulose, it is difficult to mould and crumbles easily, small cylinders have a diameter more than 7 millimeters, **then** you have a light soil. **Advantages** of a light soil: easy to work, no water retention, drains and dries easily. **Disadvantages:** it can lose its structure and fertility.

If the earth adheres a little and is rather granulose, can be moulded (with difficulty or easily), has a fissured aspect and the diameter of little cylinders is from 7 to 2 mm., **then** you have a medium soil. It has a better structure, retains fertility easily but also water and is more easily constipated.

If the earth is very adhesive, smooth and bright, can be very easily moulded and little cylinders have a diameter less than 2 mm., **then** the soil is heavy. It has a good fertility but can be easily water soaked and constipated.

Root development

In a full growing crop the extension of root network gives immediate information about the state of the soil. To observe the roots you must carefully clean them from the earth. Apart from feeding the plant, roots contribute to the evolution and stabilization of the soil structure. To evaluate the root development, you must observe: their mass, distribution, directions in the soil and if they have deformations.

Root mass: first of all you should know the “normal” root development of the chosen crop. The evaluation will depend on climate condition, stage of development and the time of



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observation. *Directions of roots*: volumes of soil not explored by roots or colonized only along existing tunnels (fissures or earthworm tunnels) are a sign of the degradation of the soil structure. *Deformation of roots*: they are signs of physical obstacles the roots met.