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Soil and Cultivation

Soil is the foundation of every farming operation. Yet if someone asked: “**What is soil?**” or “**What does it do?**” it might be a struggle to give a meaningful answer.

We all need to be challenged to articulate jumbled or muddled thoughts. This helps to clarify our understanding and to sort through and focus the information “stored away in our heads”.

Clearly then, it is important to know something about the soil before considering what impacts cultivation may have on it.

In a holistic sense, one answer to the question “What is soil?” might be that soil is a three-dimensional, dynamic, living resource that supports and sustains the growth of plants.

Every soil can be subdivided (at least theoretically) into three spheres: *biological* (living and dead animals, microbes and plants), *chemical* (nutrient storage, cycling and supply) and *physical* (structure, texture, porosity, water holding capacity etc).

“What does soil do?” – it provides the physical matrix, chemical environment and biological setting for water, nutrient, air and heat exchange for both soil organisms and the plants embedded within the soil. It also regulates the degree to which water runs off the land, infiltrates it or is stored by it. This has an important bearing on plant nutrient availability and environmental pollution.

The biological, chemical and physical spheres do not function in isolation. They are mutually independent and interact with each other i.e. the biological sphere stores many of the essential chemical plant nutrients (often in the soil organic matter). Yet plant access to these nutrients depends on good physical properties.

Armed with these answers, we are now in a better position to consider the impact of cultivation. Unfortunately, any time the soil is disturbed by cultivation, the operation and functioning of that soil is impacted.

The best soil is the topsoil. Most of the soil biological activity and chemical nutrients are found there. It also has the best physical structure. Whenever topsoil is cultivated, these benefits are compromised. Thus cultivation is always a trade-off: on the one hand is the requirement for a fine, firm, level seed bed. On the other hand, the soil that remains after cultivation may not be as good as it was before. Chemical nutrient losses can be offset to some degree by fertilisers but it takes time for good soil biological and physical features to re-develop.

Cultivation is a necessary farming activity. However, before you “hook up the plough” give some thought to the impact it may have on your valuable soil resource.