Getting back to basics of soil health

by Gill Fry

I think it never seems to hurt to go back to basics to understand the importance of soil health.

But what is a healthy soil? There have been many definitions including the following one from the DPI website. It defines a healthy soil as, “The capacity of soils within landscapes to sustain biological productivity, maintain environmental quality, and promote plant and animal health”.

My preferred definition is .... a healthy soil is one where the physical, chemical and biological components of the soil are all in balance. The soil is in harmony.

The soil should be like a big sponge filled with water, air, soil organisms and minerals. It is high in organic matter with active, abundant and diverse soil biology. It is not compacted. Instead it is aerated with high water infiltration and deep, dense root growth.

Regardless of the definition, I believe that healthy soil is the backbone of sustainable, productive and profitable farming.

Healthy soil is essential for healthy pastures, crops and gardens – it contains the building blocks for life that is air, water, structure and nutrients.

Soil is a wonderful, complex substance, made up of decomposing rock, decaying material and living organisms. ‘Healthy’ soils support and allow the best plant growth, resist erosion, receive and store water, retain nutrients and act as an environmental buffer in the landscape. Soils supply nutrients, water and oxygen to plants, and are populated by soil biota (micro-organisms), which are essential for decomposition and recycling processes.

Why is soil health important?

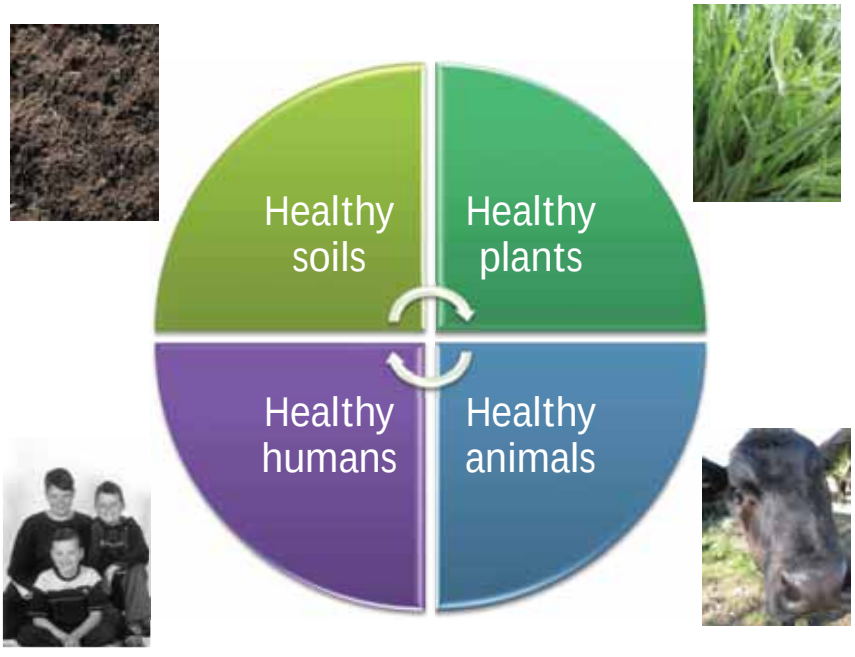
Developing effective, efficient, long-term techniques to improve soil health is essential to sustainable agriculture. Improved soil heath leads to better production performance and better financial returns.

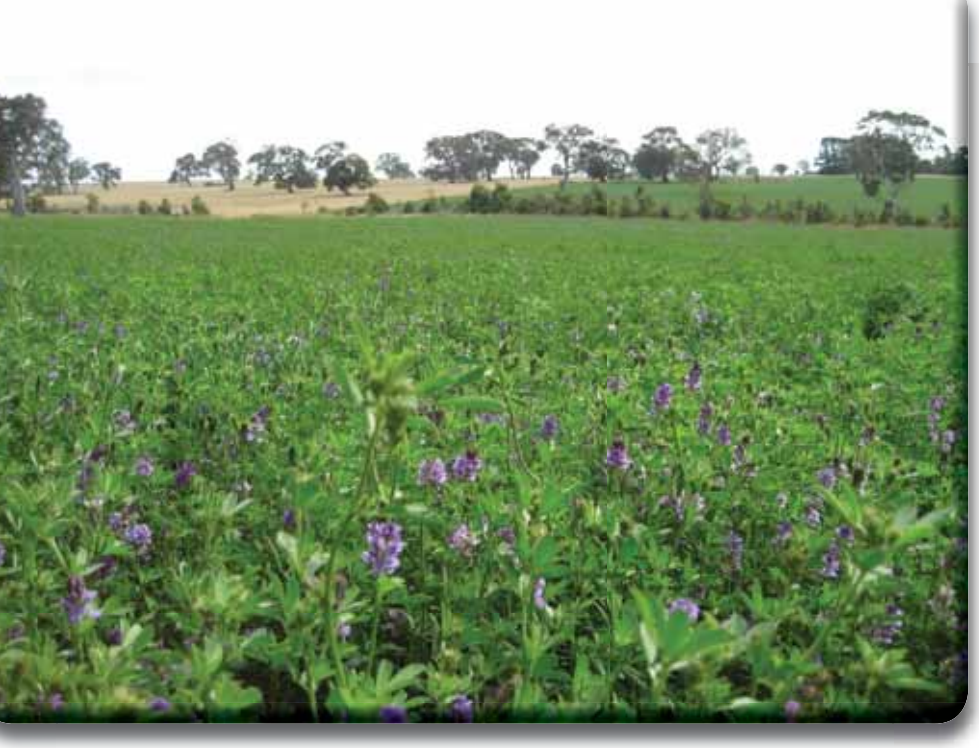
Healthy balanced soils produce healthy balanced plants which produces healthy animals and humans.

Soil health is important as it directly affects plant growth and stock health. In turn this directly affects human health. So in essence, our future depends on healthy soils.

We are what we eat. If we consume healthy food from

Fig 1. Healthy soils - the beginning in the circle of healthy life





"If we have healthy soils, they will adapt to the impact of climate change. If we have healthy soils we will have healthy plants, healthy animals and healthy humans. If we have healthy soils we will be sustainable in the future."
(Martin Stapper, Coleraine 2009)

healthy soils, we will in turn have better health and resistance to disease.

To ensure we can maintain or improve production into the future, our soils need to be healthy to be able to produce healthy pastures and crops.

The management decisions we make today affect soil health. Therefore it is important to make informed decisions and consider the soil as a holistic entity rather than focusssing on one aspect of the soil.

To make informed decisions, landholders need to be able to measure and understand their soil tests and understand basic soil health and the different management options available.

It should be noted that no one measure is an accurate measure of soil health.

It is a combination and balance between physical, chemical, biological aspects of soil which results in a truly healthy soil.

A soil in balance

As stated in the introduction, healthy soil is a living, self-organising system with physical, chemical and biological components all functioning and in balance.

Understanding soils and the functioning of soil ecosystems requires a 'big picture' holistic approach. If we only look at part of the picture, we dont understand that what we do to one component of the soil may be impacting on the other component of the soil.

For example; if we only look at the chemical components of the soils, and apply chemicals to 'correct' certain elements, we may in fact be detrementally affecting the biology or physical properties of the soil.

Physical, chemical, biological

In the human body we have a physical structure (bones, skin, organs and muscle), chemical components (nutrients, calcium for healthy bones, iron for healthy blood etc) and biology (good and bad bacteria and microbes).

Just like a human body, the soil has physical components (structure and texture), chemical components (nutrients, pH etc) and biological components (bacteria, fungi, worms and microbes).

For each part of the soil, the minerals and bacteria have to be the right ratios, and then balanced as a whole.

If it is balanced, it will be highly productive and the plants growing in the soil will be healthier and more able to fight off disease and insect and microbe attack.

Every soil on every farm, in every paddock is different. So what may work for one farm, may not necesarily work for another.

The important thing is to get to know your soils. Get down on your hands and knees and dig up some earth.

Understand that a healthy soil is a soil in balance.

"Soils are like a complex web which is yet to be untangled. There is still much to learn."