



The Soilsmart Newsletter

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Now that the drought is beginning to show signs of easing in some districts, we should consider some post drought strategies to enable the most effective recovery to maximum productivity.

Firstly let's consider the broader issue of soil health and what actually happens during drought conditions.

To grow healthy, productive, high quality, disease free plants you need healthy soil, it's an inescapable fact, and it's also why plants direct up to 95% of all the energy captured from sunlight, to their roots. You see nature recognises that the root system of the plant, and the soil environment it interacts with, are the engine room for plant health and productivity, and it sets up and maintains an intricate and balanced system. Unfortunately though man's intervention undoes much of what nature is trying to maintain.

SO WHAT'S MISSING FROM OUR SOILS?

In their native undisturbed state, our soils are rich in a diverse array of biological life forms, which play an important role in regulating soil structure and health. In commercially managed soil however, there are many intervening processes that have a detrimental effect on soil biology - the application of chemical fertilizers, mechanical cultivation (particularly destructive is rotary hoeing), pesticide, fungicide, and herbicide use, compaction from foot traffic or driving over the farm have an impact on soil biology.

There are also natural events that have a negative impact on soil biomass, however in a truly natural system the effects of drought, flood and fire are short-lived, because the soil still contains sufficient numbers and diversity of beneficial organisms to enable it to recover quite quickly. Our commercial production systems unfortunately don't recover as quickly because of the added pressures that we have created.

In most cases, although soil biological decline (which drives sustainability by the way), has happened over a long period of time, it can be restored quite effectively by adding the right biological products in a balanced program.

Achieving the correct biological and chemical balance sounds difficult, but it's actually a relatively straight forward task. The first key step however is to realise that we need to pay some attention to the restoration of the soil biomass, from this point we

have sufficient technology to tailor a program to suit practically any need.

WHAT ABOUT DROUGHT RECOVERY?

The first point to make here is that the better your soil biomass before the onset of drought, the less impact you will see during and better your recovery will be after the drought. In fact many of our customers were less affected by the current drought because their soils dried out more slowly and were more responsive to periodic rainfall events.

As the drought takes hold, the soil dries and there is less moisture for extraction of nutrients by the plant. Biological activity slows, some species are lost and others enter dormancy. The crucial biological interface between your crop and the soil is however interrupted. Soil structure will begin to collapse as the fungal "sponge" deteriorates, and less capillary soil water is available.

For some who have access to irrigation, the lack of flushing rains will mean that salinity levels have built up in the soil and this will interfere with biological recovery unless addressed. It is important to rejuvenate the existing soil biology and increase bio-diversity as quickly as possible following drought conditions.

High quality, biologically active products which have extremely high levels of biodiversity and stable Organic Carbon, are required to provide adequate results, it's not simply a case of finding a cheap source of manure or aged organic matter.

An effective biological recovery program will have sufficient activity to initiate rapid soil structural improvement given small amounts of moisture. This activity can quickly rebuild fungal and bacterial populations and create billions of micro-pores in the soil to trap capillary water (the most available water supply in the soil, for plants to access). This structural improvement also helps to retain more of the gravitational water in the soil (that which moves quickly through the profile) and ends up, along with the nutrients it carries, in the sub soil and eventually the water table.

ESTABLISH A BENCHMARK.

To develop a program that best suits the needs of a particular operation or budget, we first need to measure where you currently are, we can then add the right products to manage and manipulate soil biology toward the desired result.

Soilsmart, measure the quality and quantity of soil organisms and help you develop inexpensive and practical programs to build the life in your soil, and grow healthier plants that achieve extraordinary results.

SO HOW DO YOU PROCEED?

1. Measure and test the current condition of the soil biology and chemistry.
2. Determine the soil biological balance required by the plants (fungal or bacterial dominance)? Soil biology assays let you know the amount and types of soil organisms present, as well as, what the desired ranges of these organisms are for the plants you are working with.
3. What is the current chemistry of the soil? Any dramatic imbalance or deficiency in soil chemistry should be addressed in conjunction with the biological program.
4. Soil testing will also determine soil organic matter to determine what additions are required to promote an appropriate environment for soil organisms to be grown.

CREATING THE RIGHT ENVIRONMENT.

After we have the background information, the job is to provide the most effective biological inoculation, organic matter and the correct foods to grow and restore the beneficial biomass needed in the soil.

Different crops have distinctly different needs in terms of soil biology, so inoculation and feeding programs need to be tailored to suit. We also need to cut back a little on trying to manipulate the soil with chemicals and **GIVE THE MICROBES A CHANCE** to do their thing.

RESULTS!

As a community we certainly know and understand a lot more about the soils biological functions than we did a few years ago, and more importantly we have developed effective and inexpensive ways to rebuild and manipulate soil biology, with extremely positive results. However we still continue to build our understanding and invest in research so that we may one day fully understand all the intricate relationships in this natural system. From a

Soilsmart perspective we have 6 – 7 years of practical results and research on which to base our biological programs.

In one of the more extensive Australian trials undertaken recently, conducted for Horticulture Australia Limited by Serve-Ag Research in conjunction with the Tasmanian Department of Primary Industries, Water and Environment.

The aim of the trial was to assess a range of microbial products being offered commercially that claimed to assist in root development and control of soil borne diseases, and to determine whether treatments of transplants with microbial inoculants could improve crop vigour, yields and quality. Trials were conducted on transplanted Lettuce and Broccoli plants over the 2002/2003 and 2003/2004 growing seasons.

Two of Soilsmart Horticulture's current products (OziVerm and GranoVerm) were included in the project and were referred to in the final report as;

“.... the only products that consistently improved yields in all field trials in both seasons”

Soilsmart have a range of biological inoculants (liquids & solids) that are prepared with the greatest diversity of organisms possible - be wary of products that have just a few species present.

A good, healthy and well structured soil will hold water against the flow of gravity within the structure created by the activity of soil microbes, organic matter and larger soil organisms such as earthworms. Well structured, biologically active soils also resist waterlogging and compaction, keeping production levels and manageability up at all times.

Improving water retention and soil health are two major factors to reducing stress in pasture and cropping systems. Another great benefit from improved soil biology is that leaf matter, dying roots, prunings, and manure, (potentially harbouring pests and diseases) are effectively decomposed, not only providing organic matter to the soil, but also pest and disease populations which may otherwise find refuge in the soil or on leaf surfaces.

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