



# AgSolutions

A U S T R A L I A



**Common Sense Ideas to Manage Your Soil for Profit**

## Who will work for FREE...and WHERE do you find these workers???

### In your soil...

An amazingly diversified array of soil organisms such as worms, arthropods, beetles, insects and microbes work 24 hours a day, 7 days a week, 365 days a year for you **FOR FREE...** *If your soil is healthy.*

Soil organisms range in size from earthworms and dung beetles down to fungi and single celled bacteria that are as small as 0.001mm.

80-90% of the biological activity in your soil is carried out by micro-organisms - the "unseen workers".

You can't see them but you can see the result of their work... *they are vital to soil health and fertility - and your profits.*

### How they help...

**The Structural and Nutritional aspects of your soil fertility will both benefit when you increase the Biological activity... The life in your soil.**

#### 1. Improved soil structure & erosion control...

The physical activity of worms, insects, and arthropods create large and small pores in the soil profile. These pores allow air and water to move freely through the soil, giving effective water infiltration as well as drainage.

Bacteria and fungi excrete polysaccharide (mucus like compounds) that bind soil particles together. Also, many soil fungi possess root like structures known as hyphae. This thread like network of structures help to bind soil particles together to improve stability and structure.

#### 2. Neutralizes pH...

Microbe activity will help to neutralize the pH in both acid or alkaline soil.

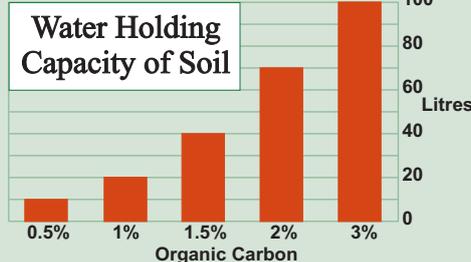
#### 3. Create a Storehouse for Moisture and Nutrients...

The biomass of microbes in healthy, living soil can easily amount to 4 - 5 tonne per hectare.

Minerals, Mulch, Moisture and Air are essential for microbes to thrive. Under optimum conditions, *these microbes will produce their own weight in humus every day.*

Good levels of humus in your soil provides a reservoir for mineral nutrients and can hold up to **200kg of Nitrogen per hectare.**

As well as being a reservoir for nutrients, humus provides a storehouse for water... helping to drought proof your farm. Organic Carbon is an indication of humus levels and the higher the level - the greater moisture holding capacity in your soil.



**50kg of soil with 1% Organic Carbon can hold only 20 litres of water. Soil with 3% Organic Carbon provides storage for 100 litres.**

**Good reserves of humus in your soil will help to provide a constant supply of moisture and nutrients to your crop - increasing plant health and yield.**

#### 4. Increase Nutrient Availability...

Soil organisms are professionals at making nutrients available in the soil. Dr Wes Jackson U.S.A. has found that soil devoid of life compared to soil worked by soil organisms has shown significant increase in nutrient levels. For instance...

Exchangeable Potassium	1200% increase
Available Phosphorus	700%
Nitrogen	500%
Available Magnesium	200%
Organic Carbon	200%
Exchangeable Calcium	150%

Many plants form intimate and symbiotic relationships with bacteria and fungi in order to increase the uptake of specific elements. Obvious examples include Rhizobium bacteria with legumes for increased Nitrogen, and Mycorrhizal fungi (VAM) which releases locked up Phosphorus and other nutrients from the soil environment.

**These microbes are naturally occurring in healthy soil.**

#### 5. Disease Suppression & Prevention...

Soils with high levels of organic matter and microbe activity can prevent more aggressive plant pathogens (diseases) from taking hold. These are termed suppressive soils. (Co-operative Research Centre for Soil and Land Management.)

#### 6. Chemical Clean Up...

Soil microbes can act as bio-filters to clean up pollutants in your soil.

#### 7. Long Term Productivity...

Micro-organisms and earth worms produce the most nutritionally charged soils in the world.

The health of a plant is a reflection of your soil. For increased productivity and greater profits....

### For Soil Management Advice...

Fertile soil can **INCREASE** your production and **SAVE** you money.  
Fax over your soil test or phone us for practical advice on how to restore balance to your soil

**PHONE 1800 81 57 57**  
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**Turn the page...**  
**Find out WHY soil microbes have become depleted and WHAT you can do about it!**

# SOIL MICROBES...

## Getting them to *WORK* for YOU !

### Microbes - the forgotten workers...

Due to our inability to see many soil organisms with the human eye, the "Life in the Soil" has not featured prominently in land management practices.

To give you a brief insight into the plight of soil organisms, here is a list of the common causes that deplete microbe populations.

1. **Natural Causes...** hot and dry weather, cold conditions, or *too* much rain.
2. **Lack of Organic Matter** - essential food source and habitat for soil organisms.
3. **Mineral Depletion** - vital food source for soil organisms.
4. **Compacted Soil** - microbes require air for survival.
5. **Soil Tillage** - high speed and over tillage can be detrimental, however soil aeration is beneficial.
6. **Poor quality Irrigation Water** - with high salt and chloride levels.
7. **Mono Cropping** - crop rotation with a legume increases microbe activity.
8. **Fertilizer Application** - trials have shown that where 80kg/ha of Nitrogen fertilizer was applied, the microbial population fell by 25% . (Ref. Life in the Soil)
9. **Chemical Applications** - foliar applied chemicals are less harmful to soil organisms than those applied into the soil. Repeat applications escalate microbe depletion rate. (Ref. Life in the Soil)

### Where do we go from here?

Microbe depletion has not occurred overnight, however significant changes are already happening with farmers now being aware of the need to increase the biological activity in their soil.

Minerals and mulch are the key ingredients to stimulate microbe and worm activity - helping to *restore the three aspects of soil fertility* - *Biological, Nutritional and Structural.*

Your local Agent

### Common Sense Solutions...

It is now recognized that microbe activity is vital for soil and plant health. Without them, everything in your soil stops... and your crop becomes increasingly dependant on water soluble fertilizer.

If our body is sick, it has been common practice "fix" the problem with drugs - sometimes with marked side effects. It is only recently that many people are looking further than the quick fix. In fact they are looking for the cause.

We need to ask - "What has caused the depletion of the microbes and worms in the first place?"

Microbe depletion has happened over a long period of time and the reasons can be many and varied. A combination of weather extremes, the increasing use of chemicals in agriculture and soil compaction are all contributing factors. Overall, Australian soils are renowned for low Organic Carbon and humus levels. Research has shown that these levels are being further depleted - and that extra fertilizer is not the long term solution.



### Natra Min - the Key to Soil Fertility

Soil fertility is dependant on microbes and the **best way to replenish microbes in your soil is to stimulate and support the diverse range of naturally occurring microbes that are already there .**

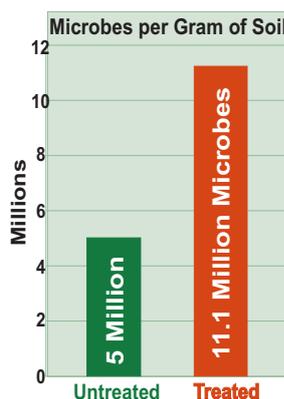
**Natra Min is formulated to stimulate the microbes in your soil - and to provide them with their essential food source - Minerals.**

## NATRA MIN

*Two products in ONE...*

### Microbe Stimulant & Mineral Supply

### 122% Increase in Microbe activity



*Where soil was treated with Natra Min...*

**Increased microbe activity in your soil will...**

- \* Increase humus levels
- \* Increase nutrient availability
- \* Improve soil structure
- \* Increase water penetration and drainage
- \* Balance soil pH
- \* Reduce Chloride & Sodium levels

**For your plants this means...**

- \* Constant nutrient supply - less fertilizer required
- \* Healthier plants with reduced disease and pests

**For you...**

- \* Improved quality of produce
- \* Reduced costs

For EXTRA Phosphorus  
Calcium & Sulphur

NATRA MIN  
HI-Phos

NOW  
AVAILABLE



BFA Certified  
AI 437  
for Organic Use

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### NEXT ISSUE...

**Soil Nutrition...**

We'll look at the effect specific elements have on nutrient availability... and **why** a broad spectrum of minerals is vital to the health of your soil.

## MINERALS - the Building Blocks of Fertile Soil