

# Impacts of Improving Soil Biology

## Grech Farms - (Paul Grech) – Camden NSW

Control: Untreated plot

Treatment: OziVerm applied at 3 tonnes per hectare

Production declines can be difficult to understand, particularly, when, in the case of Grech Farms, regular soil testing was not indicating any chemical deficiencies or imbalances that could be used to justify the decline. The particular block that was of most concern, was showing physical signs of decline, soil structure was compacted and it was becoming increasingly difficult to work and water.

This field scale trial involved applying OziVerm to the Grech's poorest potato block which was rated the poorest because of the gradual decline in yields that had been occurring over the past few years. In fact the block was now producing some 30% less than the farm average. The block had also become progressively harder to work, and had poor moisture retention and infiltration qualities, because of soil compaction which had increased over time.

OziVerm was applied to half of the block (at a rate of 3 tonne per hectare) and the other half remained untreated, all other inputs and management was identical for the two areas.

### Observations

There were a number of measurable and observable differences between the two areas as the crop and harvest progressed. The first observation that Paul made was that the treated area was easier to wet, was more tolerant of dry conditions and showed an overall improvement in plant health. At harvest Paul noted that the potatoes dug from the treated area were more uniform in size, in fact Paul said he has never seen potatoes coming up the harvester where every one looked exactly the same.

At harvest the treated area produced an amazing 57% more than the untreated area, and 29% more than the farm average. The overall effect of better sizing and increased yield, resulted in approx \$5400 per hectare additional income over the treated area, and approx \$3200 over the farm average (after taking the added cost of treatment in account).

Following harvest, soil samples were taken and analysed for both chemical and biological properties. The following table is a summary of the soil analysis data.

The potatoes were followed by an oat crop and the difference in establishment and vigour in the oats could be seen from the house some 400 -500 metres away. Paul also commented when re-working the block in preparation for the oat crop, that he could use a higher gear to plough the treated area.

Summary of changes to Soil Biology and Chemistry in OziVerm treated soils	
<b>Total Bacteria</b>	21% Increase
<b>Active Bacteria</b>	119% Increase to an acceptable level
<b>Total Fungi</b>	81% Increase
<b>Active Fungi</b>	606% Increase to an acceptable level
<b>pH</b>	5 % Increase
<b>CEC</b>	18 % Increase
<b>Organic Matter</b>	5% Increase
Residual Plant Nutrients were also higher in the treated area.	

Soilsmart products and technical services are specifically designed to help manage one of the most complex and diverse eco-systems on earth - the interface between the soil and the plants we grow.

Soilsmart products will help you to build a strong and balanced biological soil eco-system, maintain aerobic soil conditions and develop a disease suppressive environment in the root zone.

#### Biological Diversity

The plants we rely on to grow quality crops, turf surfaces and landscapes all evolved in the presence of, and rely on, a strong and symbiotic relationship with beneficial soil organisms which play a significant role in regulating the health of the entire plant/soil eco-system.

The key to success however is diversity - nature is built on it — consequently we have developed a range of products and programs that have a broad bio-diversity and offer long term benefit. They are also based around indigenous Australian biological species which are suited to our climatic and soil conditions.

Even small changes to your existing programs can improve biology and quickly translate into improved aerobic soil conditions and healthier and more resilient plants. These advances also result in more extensive and vigorous root systems and an increase in water use efficiency. Maintaining bio-diversity and balance also encourages the conversion and retention of minerals, increasing fertilizer efficiency and minimising the need for repeated applications.

Soilsmart products and programs allow you to stay ahead of pests and disease and offer a truly preventative approach to soil and plant health by:

- Building Organic Carbon reserves in your soil.
- Establishing a natural defensive network against disease and pests.
- Strengthening plant health and stress tolerance.
- Increasing fertilizer efficiency.
- Sustaining soil Oxygen levels.
- Reducing costs and improving risk management.

The science that enables us to measure and manipulate the soils' biological properties has advanced rapidly in the past decade, bringing about a much better understanding of how we can influence this very complex bio-system to our advantage. Soilsmart have maintained an association with and are accreditation with organisations like The Soil Foodweb Institute USA, who are at the forefront of research and technology development in this important area of environmental management.

