

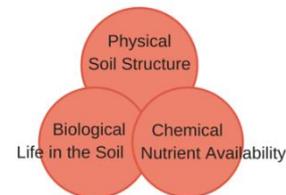
## Biological Farming Roundtable Notes

**What:** The Biological Farming Roundtable was held at the NutriSoil Production and Education Facility on the 28<sup>th</sup> of May 2015.

**Why:** The Aim of the Biological Farming Roundtable is to use papers/articles written by leading biological thinkers to initiate discussion and to help Farmers learn and apply the information on farm.

**Who:** This Roundtable discussion was based on Dr Maarten Stapper's paper– "Soil Fertility Management – Towards Sustainable Farming Systems and Landscapes."

Maarten's paper is a 'big picture' holistic approach to farming systems. Maarten speaks of a self-organising system that takes into account the physical, chemical and biological components being in balance.



### Paradigm Shift

In order to make the necessary changes to a more resilient farming system we need a change in our Paradigm (thinking).

Group's definition of a Paradigm:

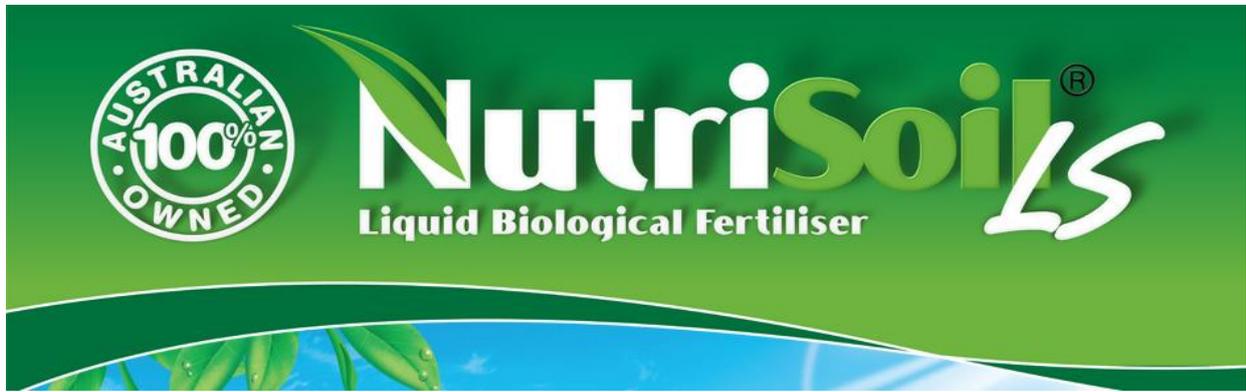
- It's about how the assumptions, conceptions, values and practices create a way of viewing reality.



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: [enquiries@nutrisoil.com.au](mailto:enquiries@nutrisoil.com.au)

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



Group example of a current paradigm:



**“We need to grow crops that have no weeds, are tall, green and sown precisely.”**

In order to achieve this we **THINK** we need:

Action	Impact
Herbicides to kill weeds	Impacts diversity and abundance of microbes.
Pesticide to pre-empt insect attack	Kills beneficial predator biology thus requiring continual use on future crops.
Often sown with a disk plough	This slices and dices the microbes.
Often land in fallow prior to sowing	Without green plants to build carbon through photosynthesis, this reduces carbon and leaves microbes without a food source.
NPK fertiliser	This decreases the soils ability to create its own biological N; Impacts the relationship of the plant and microbes; Creates smaller root systems; Reduces water infiltration; Causes nutrient lock up; Reduces the soils ability to create Carbon stocks and Reduces nutrient quality of crop for human or animal consumption.
Superphosphate	This creates an acidic environment, detrimental for soil microbes.



**AND YET WE STILL ENJOY LOOKING AT THE BEAUTIFUL CROP.**

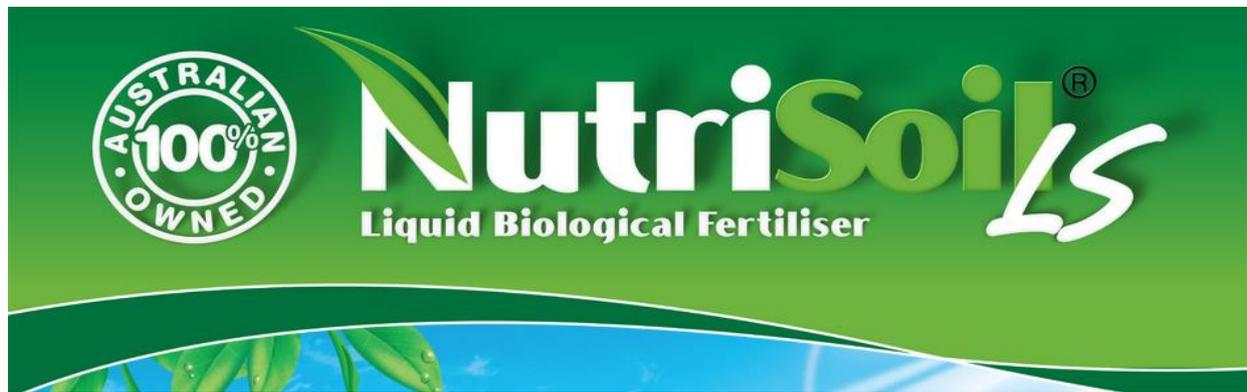
**The Challenge is HOW to make the paradigm shift!**



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

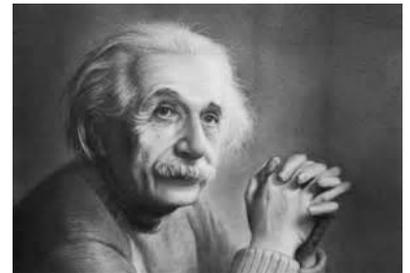
Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: [enquiries@nutrisoil.com.au](mailto:enquiries@nutrisoil.com.au)

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



*Dr Albert Einstein said:*

*“No problem will be solved with the same level of thinking that created it in the first place.”*



#### **Key points Discussed from the Article:**

1. “We have learned to see the world in a certain way. We have blind spots to how we see agriculture, our habits, perceptions and assumptions are determining what we see and want to see.”
2. Carbon is critical!  
As per Dr Christine Jones paper “Nitrogen – The Double Edged Sword” discussed at the last BFR.  
  
Soluble N fertiliser makes plants more susceptible to diseases, insects, and increases weed problems. Water Soluble Nitrogen results in plants sucking it up quickly – this causes the plant to reduce its reliance on the microbes to make Nitrogen
3. Plants are smart! When the plant reduces its reliance on the microbes, it no longer needs to provide exudates to feed the microbes in exchange for minerals. Microbes use stored Carbon as a food source. They in turn make less Carbon, hence, Carbon is lost from our soils.
4. **IT’S ALL CONNECTED!** “For every action on a complex, interactive, dynamic system there are unintended and unexpected consequences. These unintended consequences are recognised later. It’s very difficult to make the connection to the cause with such delayed consequences.”

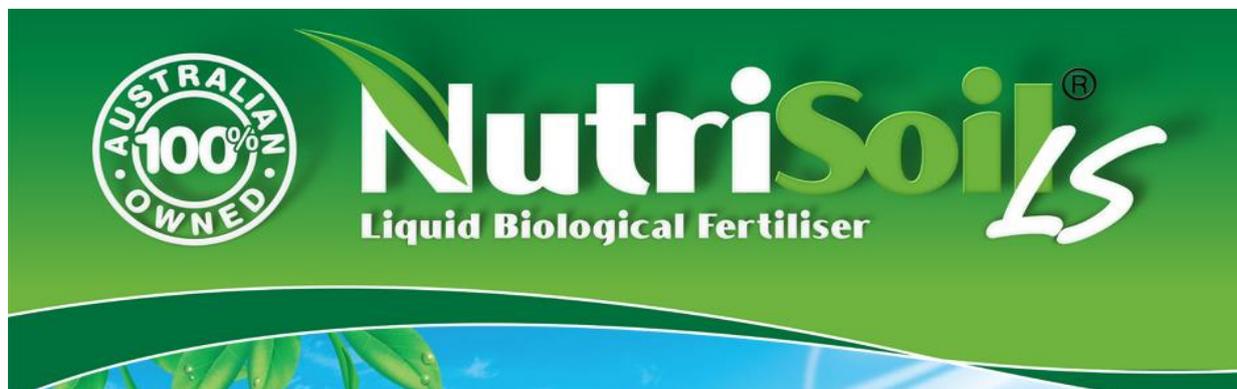
This is very similar to the connection between a reduction in the nutrient values of food to rise in diseases such as cancer, cardiovascular disease, Alzheimer’s and diabetes.



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: [enquiries@nutrisoil.com.au](mailto:enquiries@nutrisoil.com.au)

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



5. **PROBLEM** “Soils have been partitioned into separate isolated fields of chemistry, physics and biology. – We are blind to larger cycles and patterns within which component parts exist. New problems are emerging - each of them are dealt with as single issues, resulting in partial solutions causing problems to another. **Everything is linked.**”



Cog wheels are representative of the linkages in our ecological system.

**Management Tools:**

1. **Weeds:** “Weed growth is minimised when soil minerals are in balance and there is the lowest level of freely available Nitrogen.”

**Group Discussion**

**How are people applying Nitrogen in their soils? Have we seen the connection of decreased N to reduced weeds?**

- Graziers were not applying water soluble N.
- NutriSoil.
- Biological Fixation – Encouraging the microbes to convert atmospheric N into plant available N.
- Crop Residues - Can take several years to breakdown.
- Animal manures.
- Compost Teas.
- Planting legumes.

**How are people managing their weeds?**

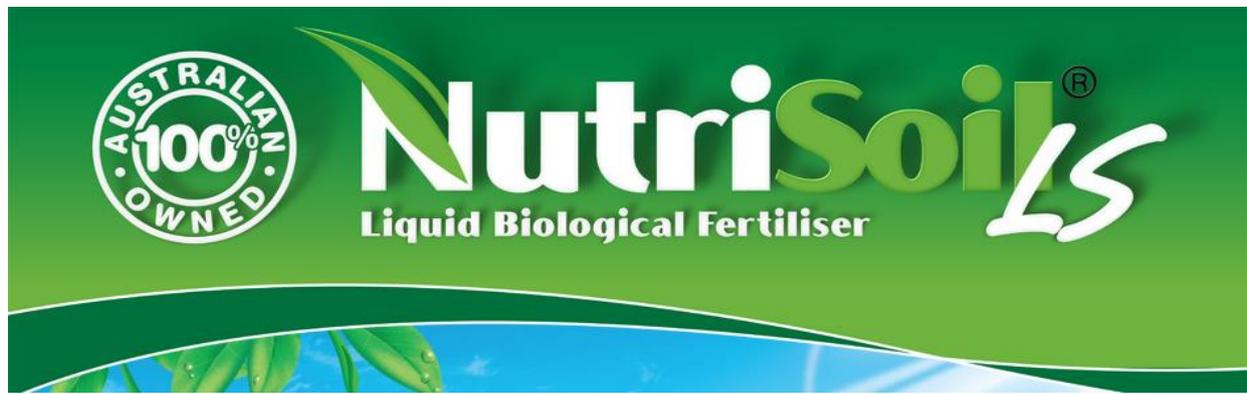
Action	Impact
Slashing/Green Manure	This provides opportunities to convert rainfall into soil fertility.
Chisel Plough	This loosens the soil but leaves the trash on top.
Ground cover/Weed succession	Outcompetes weeds



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: enquiries@nutrisoil.com.au

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



Rotational Grazing/Mob Grazing	This stimulates soil biology. When cattle urinate on the whole pasture the urine covers the leaf of the plant with a protection of bacteria which wards off pests and diseases. It also rests paddocks.
Sowing Oats and Rye Grass	Chokes out the weeds; Oats have a large tap root to loosen soil; Rye grass succeeds Oats keeping green ground cover.

#### Preventing weeds with Bio friendly inputs:

- Using steamed chook manure high in phosphorous as opposed to Superphosphate
- NutriSoil – Worm Liquid
- Applying trace minerals
- Paramagnetic dust – partially aligns with the earth’s magnetic field
- Compost
- Milk
- Compost Tea
- Fish
- Worm Castings – high in phosphorous for sowing; high in calcium resulting in a liming effect.
- Lime

#### Biological Knockdown Recipe

If using glyphosate Maarten suggests the following process to reduce the amount needed for the same knockdown.

1. Add half the recommended rate of glyphosate to recommended water
2. Add 1 litre of fulvic acid
3. To bring down the PH level of the mix add some citric acid – use a PH tester to take the mix to a PH of 4.

**Impact:** When the fulvic acid in the mix hits the green plant, it opens the cell walls and the mix is taken in more easily by the plant. Also farmers have reported that adding NutriSoil has worked in the same manner, as the humic compounds produced from the worm include fulvic acids.

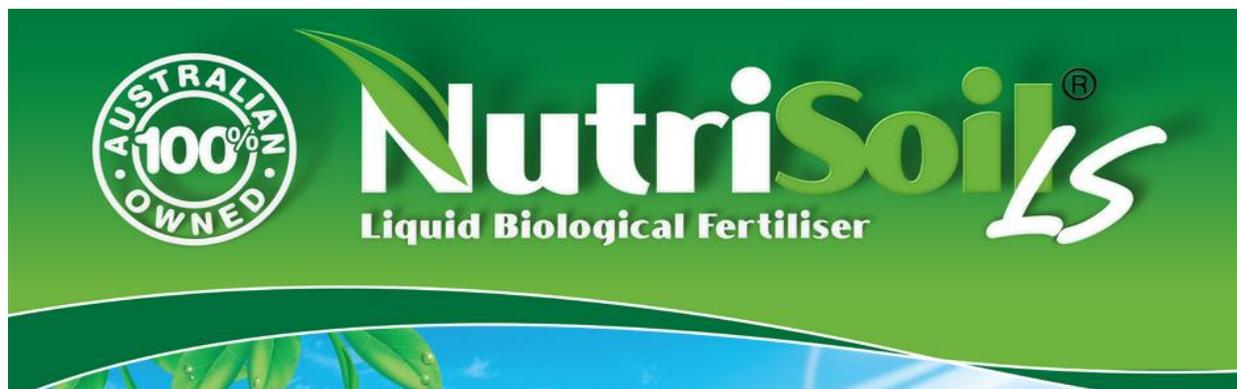
2. **Insects and diseases:** Healthy soils are a preventative measure, the biological activity builds internal plant resistance to disease and insects.



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: enquiries@nutrisoil.com.au

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



**What pest and disease protection methods are people taking?**

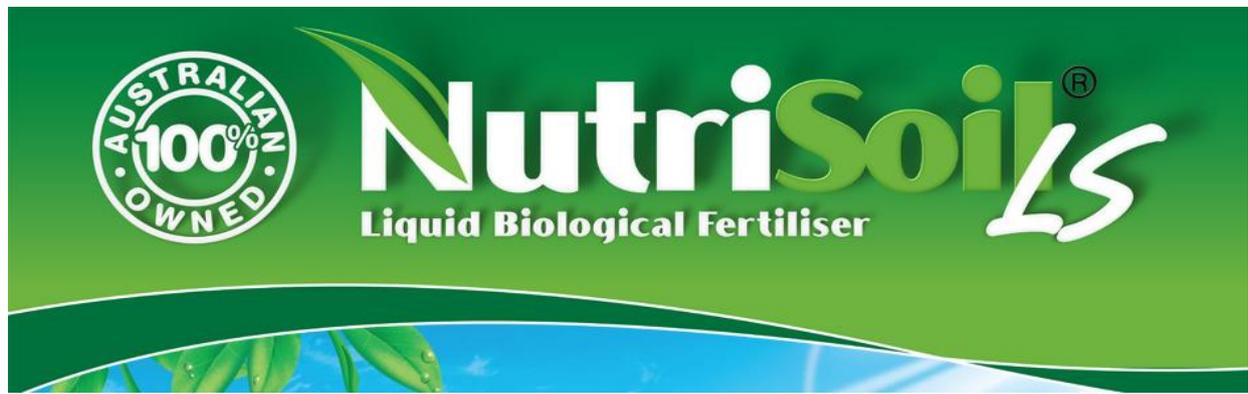
Action	Impact
Some farmers were not drenching their sheep	Soils with a healthy microbial community break down manures efficiently. Fertilises soil without drench residue when animals manure.
Some farmers not worried by insects – unless they are causing uncomfortable amounts of production loss. *See Redlegged earth mite example below	Ensures healthy microbial populations are not harmed. Sometimes the weakest microbes are the most important. Keeping a healthy diversity of microbes ensures pathogens and root eating microbes do not have monopoly to multiply.
Rotational Cropping	Gives various nutrients to the soil. Reduces the build-up of pathogens and pests that often occurs when one species is continuously cropped.
Diversity of pasture/crop sown	More diversity of plants the more checks for pests and diseases.
Inoculating seed with NS	NS coats the seed with beneficial microbes that fend off the pathogens and also provides an available nutrient to support germination.
Reduced inorganic N	High rates of N application will lead to weed and pest problems.
Salt licks, mineral blocks and Cod Liver Oil <a href="http://www.olsens.com.au">www.olsens.com.au</a> (A mineral block supplier recommended in the group)	Assist in vitamin intake.
Apple Cider Vinegar	It acts as a natural antibiotic when added to water troughs.
Introduction of Dung Beetles	Successful in breaking down manure pads in paddocks. Well broken down manure leads to reduced need to drench.



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: [enquiries@nutrisoil.com.au](mailto:enquiries@nutrisoil.com.au)

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



**\*Redlegged earth mite:** These insects do not find sweet plants palatable and generally will feed off sick less resilient plants. One farmer provided an experience: Found redlegged earth mite on pasture. Wanted to spray pesticide but knew that if he sprayed once then he would be on the treadmill of having to continually spray. In three repeated applications, applied 5L/H NutriSoil which increased the brix (sweetness), Redlegged earth mite's left the pasture. The use of a pesticide can do more damage to the fertility of the pasture than the Red Legged Earth Mites. Similar results with Lucerne Flea were reported with applications of NutriSoil.

- 3. Rhizosphere:** "Fertiliser applied with the seed at sowing decreases root growth, root branching and the number of root hairs. " Need to encourage microbes, microbial foods and humic substances at seeding.

**What are people using at sowing time?**

- NutriSoil at 5L P/tonne of Seed or 5L liquid inject P/H
- Fish
- Compost Tea
- Milk
- Minerals
- VermiCast



**Making the Paradigm Shift– Save Money and Grow Productively, Naturally.**

**Old Paradigm**

Many Farmers believe that you have to use superphosphate in cropping because you are removing phosphorous from the soil when you harvest.

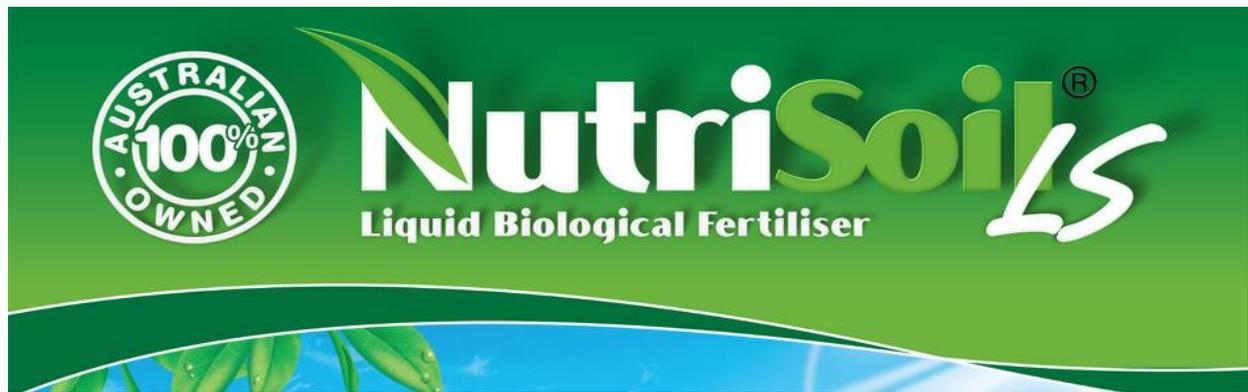
Maarten explained that there are some sub soils in Australia that can be low in phosphorous. Sub Soil is the layer of soil under the topsoil on the surface of the ground. Like topsoil, it is composed of a variable mixture of small particles such as sand, silt and/or clay but it lacks the organic matter and humus content of topsoil.



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: enquiries@nutrisoil.com.au

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)



### **New Paradigm**

If farmers use a system that feeds microbes and encourages the biological processes to make Carbon then phosphorous will not be a limiting factor in these areas. The more Carbon built in soil the more minerals available to plants that are held in this zone. Soft Rock Phosphate can be used while soils are regenerating as opposed to Superphosphate which is very expensive, acidic and degrading soil fertility.

### **Summary**

“Active Management of the soil food web, remineralisation, and a substantial increase of soil organic carbon are essential to reaching ecologically sustainable production systems...Such a system produces healthy food with good taste and structure.. and extended shelf life”.

### **Next Biological Farming Roundtable:**

**When:** Thursday 25th June 2015

**Time:** 10:00am – 12:00pm

**Where:** NutriSoil Production and Education Facility, 343 Whytes Road, Baranduda, VIC, 3689.

**What:** This Roundtable we will be discussing the article **Sentinels of the Soil, Power of Earthworms – Acres June 2015**. (Download from our website) Morning tea provided.



Mailing Address: PO Box 1610 Wodonga VIC 3689. Street Address: 343 Whytes Road Baranduda VIC 3691.

Phone: (02) 6020 9676 WORM Fax: (02) 6020 9602 Email: [enquiries@nutrisoil.com.au](mailto:enquiries@nutrisoil.com.au)

[www.nutrisoil.com.au](http://www.nutrisoil.com.au)