



# AgSolutions

A U S T R A L I A



## Products & Advice for Regenerative Agriculture

### Do you have a phosphate bank in your soil?

If you have used phosphate fertilizer in the past, then the answer to that question is probably "YES"

#### CSIRO Research...

"It is thought that at best, just 20 per cent of phosphorus applied by way of fertilizer is available for plant uptake in the year it is applied.

This means, that of the dollars spent applying phosphate fertilizer at a rate of 250 kg per hectare (about 22.5 kg of phosphorus) often just one tenth of this phosphorus (2.25kg) is immediately available to plants." (Source: CSIRO article, Raiding the Phosphate Bank, 1997)

The obvious question here needs to be...

#### WHY?

#### Why is only a small amount of applied phosphorus fertilizer available to the plant?

Perhaps part of the answer is to be found in separate research to the above. In research carried out by Cooperative Research Centre for Soil & Land Management it was found that high levels of fertilizer can **reduce the effectiveness of soil organisms.**

For example, high N inputs reduce Nitrogen fixation and **high P inputs reduce beneficial effects of mycorrhizae.**

"Successive generations of Australian farmers have applied huge quantities of phosphorus fertilizer to combat the problem of chronic phosphorus deficiency in their soil. **This has led to a massive bank of "fixed" phosphorus, estimated at close to \$10 billion at current Superphosphate prices.**" (Source CSIRO article, Raiding the Phosphate Bank, 1997)

#### The role of VAM in phosphate availability...

It is a well known fact that VAM (mycorrhizae fungi) is essential for the release of phosphorus.

In addition to the detrimental effect that applied fertilizer has on the soil microbe population, it has also been found that the use of herbicides significantly depress micro organisms.

Canadian studies have shown that as little as 1 part per million of Roundup can reduce the growth or colonization of mycorrhizae fungi.

Drought conditions also contribute to a reduction in VAM, while crops such as mung bean, chickpea and maize perform a valuable role in crop rotations as they contribute to increased levels of VAM.

#### How BIG is the Phosphate Bank?

It is thought that each hectare of soil may hold up to 400 kg of phosphorus, with less than 4 kg immediately available to crops or pasture. (Source CSIRO article, Raiding the Phosphate Bank, 1997)

A soil test will only show an estimate of the nutrients that are available to the crop. It is possible to have a "total test" done which would show exactly the amount of each element in the soil.

While this would give some benefit to have this information, it is a very safe bet that if you have applied phosphate fertilizer in the past, then there will be at least some Phosphate locked up in your soil.

#### How you can SAVE \$\$\$'s on fertilizer...

The obvious question you would be asking now is how can you get the locked up phosphate in your soil to release and save your fertilizer dollars.

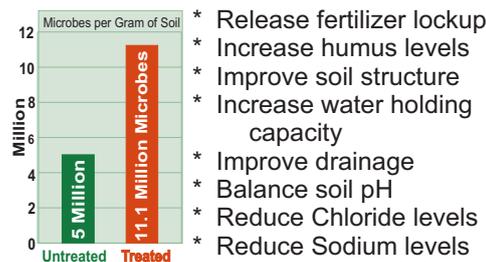
The short answer is by following a soil management program to increase the microbe population in your soil.

That is where Natra Min or Natra Min HI-Phos can help. Both of these products are formulated to stimulate microbe and worm activity in your soil, thus helping to improve pH and release plant nutrients from the soil.

Coupled with a soil management program that includes crop rotation and mulching, the use of water soluble fertilizer can also be reduced.

#### 122% Increase in Microbe activity where soil was treated with Natra Min

Increased microbe activity in your soil will...



#### For your plants this means...

- \* Constant nutrient supply
- \* Less fertilizer required
- \* Healthier plants
- \* Reduced disease and pests

#### For you...

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

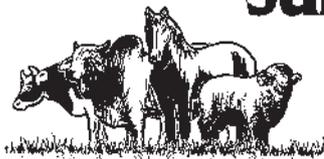
Even the results from applied fertilizer are linked with a healthy soil microbe population.

### For Soil Management Advice...

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

PHONE 1800 81 57 57  
FAX 07 5482 7219  
Ag Solutions Australia Pty Ltd  
8 Wadell Road, Gympie 4570

Find out how Natra Min & Natra Min HI-Phos can help you to restore fertility to your soil.  
PHONE 1800 81 57 57



## **MINERALS: their Function & Deficiency Symptoms in Animal Nutrition**

All minerals are required within finite and sometimes quite narrow limits with deficiencies, excesses, or imbalances resulting in symptoms ranging from minor reductions in performance to death.

While the symptoms of most gross deficiencies or excesses are obvious and easily diagnosed by veterinarians or experienced stockmen the major practical problems are encountered with sub clinical deficiencies. The symptoms may be vague unthriftiness or lowered performance, often seasonal in nature. They are so common and widespread that the slightly lowered production or reproduction rates are considered normal.

**For optimum health and productivity, SUPERIOR Mineral Supplement provides the broad spectrum of the following essential minerals.**

**Calcium.** One of the most important elements in the body and in the soil. Required for a wide range of bodily functions and particularly for healthy bones and teeth. Required in a ratio with Phosphorus of 1:1 to 8:1. It is now realized that the old idea of a strict 2:1 ratio is not required provided both calcium and phosphorus are adequately supplied. Recent research indicates that requirements are not as high as was once thought provided that Calcium is provided in a form readily absorbed by the animal and in balance with other minerals. Deficiencies are often associated with grain feeding or grazing improved pastures, particularly tropical grasses. Classic symptoms include hypocalcaemia or milk fever, rickets, skeletal abnormalities such as "big head" and stunted growth.

**Phosphorus.** Plays an important role in the conversion of feed into energy. Phosphorus is the most limiting factor in cattle production in wide areas of northern Australia. Classic deficiency symptoms include brittle bones, "peg leg", depraved appetite, emaciation, poor appetite, low production and reproduction. Recent research has indicated that requirements are not as high as previously thought. Response to supplementation is often enhanced when the supplement includes calcium, sulphur, manganese, and copper. Excessive rates of supplementation may result in reduced absorption.

**Magnesium.** Essential for many vital processes in the animals body, particularly for carbohydrate metabolism. Deficiency symptoms include nervous behavior, stiff stilted gait, twitching face and ear muscles, collapse, sudden death (grass or oat tetany). Animals particularly at risk are grazing lush oats or grasses in cool humid weather.

**Sulphur.** Essential in the formation of a number of amino acids. A major component of wool. The important fungi in the rumen have a high requirement for sulphur. Assists in the detoxification of prusic acid in forage sorghum. More readily available in green pasture and almost universally deficient in

dry feed. Deficiency reduces the animals' ability to digest roughage and can lead to marked reduction in production due to reduced microbial protein.

**Potassium.** Important in the regulation of osmotic pressure, muscle contractions, and certain enzymatic reactions. Deficiency symptoms include reduced weight gain, depraved appetite, rough coat and muscular weakness. May be associated with calving and lambing difficulties.

**Iron.** An essential component of a number of proteins involved in oxygen transport and utilization. The typical symptom of deficiency is anemia.

**Silica.** The most overlooked element in animal nutrition. Plays a vital role in cell formation. Of particular importance for hair and hoofs. Deficiency symptoms are reduced bone formation and cartilage / collagen strength.

**Manganese.** An essential biocatalyst in normal growth and bone development, maintenance of body weight, and proper function of reproductive and mammary glands. Activates calcium, phosphorus, and iron. Important for rumen bacteria. The most important symptoms of deficiency include the reduction in the ability to absorb phosphorus and a reduction in microbial protein.

**Zinc.** Important for the normal function of the immune system. Required for healthy skin and coat. Deficiency symptoms include reduced production, reduced testicular growth, and swollen feet.

**Copper.** Rates second to Phosphorus as the most common limiting mineral in animal production in northern Australia. Deficiency symptoms include dull rough coat, lack of colour in coat, steely wool, fragile bones, reduced growth, poor reproduction, sudden death. Deficiency often occurs in association with cobalt deficiency. Deficiency symptoms often caused by excess supplementation with sulphur or over use of fertilizers containing molybdenum.

**Cobalt.** Required by the rumen bacteria to synthesize vitamin B12. Typical symptoms include a "wormy" appearance, running nose and eyes, anemia and death.

**Boron.** Believed to be necessary for the synthesis of calcium and magnesium.

**Molybdenum.** Deficiency symptoms include scouring.

**Selenium.** Required to produce antioxidants. Deficiency symptoms include "white muscle disease", poor growth, reduced wool growth, heart attack. Selenium has a very narrow safety margin.

**Fluorine.** Most often encountered as an excess particularly with stock drinking bore water. Levels in supplements should be kept to a minimum.

Your local Agent



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for Organic Use  
AI 437

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### **NEXT ISSUE...**

Soil degradation has resulted in increased fertilizer costs to maintain crop production. Move towards low chemical farming practices to regenerate soil fertility and reduce costs.