Soft Rock Phosphate and Fertility




*The status of **phosphorus** as a critical element in plant growth has never really been in doubt, but recent evidence suggests that this element may be even more important than previously realized. Research into high production fertility has revealed that, although the presence of adequate phosphate is essential, the **type of phosphate** appears to be at least as important. The acid-treated phosphates, which include super phosphate, triple super, MAP and DAP, appear to have serious problems in relation to stability and ongoing plant availability. Natural rock phosphate, or hard rock phosphate, also has problems. It is a very slow release source of phosphorus, which is mainly of value in acid soils with high humus levels. **Soft Rock Phosphate or colloidal phosphate** is the only problem-free source. It is the choice of consultants involved with sustainable agriculture throughout the world. Queensland company, **Nutri-Tech Solutions Pty Ltd**, is the exclusive distributors of a genuine Australian alternative and the local product ranks amongst the best. **Nutri-Phos Soft Rock** is available at competitive rates in all states.*

What is Soft Rock Phosphate?

Soft rock phosphate is a by-product of the hard rock phosphate mining industry. Hard rock phosphate, also known as tri-calcium phosphate, is treated with sulfuric acid to produce **super phosphate**. The phosphate content is reduced to a water-soluble form, and the sulfur bonds with the calcium to form **gypsum**. To produce **triple super**, the super phosphate is further treated with phosphoric acid to strip out the gypsum and produce a concentrated form of soluble phosphate. Chemical gypsum is a by-product of this refining process.

Soft rock phosphate is the soft, colloidal clay that lies between the various layers of hard rock phosphate. This colloidal clay is washed off and accumulated in settling ponds during the mining process. The phosphate source is completely natural, and it is in fact a truly remarkable fertiliser. It provides tremendous benefits to soil, microbe, and plant life. In contrast to the chemical phosphates, Nutri-Phos improves soil structure, providing ideal microbe conditions, and the earthworms love the stuff.

Soft rock phosphate should not be confused with hard rock phosphate. Hard rock phosphate, or natural rock phosphate, is not plant available. The mined rock is finely crushed, but the end product is released fairly slowly, particularly in alkaline soils. **Nutri-Phos** is a completely different ball game.

How does your phosphate compare?

There are three criteria, which should be used to determine the relative value of any fertiliser, and they include **performance, price and sustainability**.

The reason for the acid treatment of hard rock phosphate is to separate the phosphate from the calcium, thereby providing a soluble, concentrated phosphate source and improving **performance**.

In principle this sounds like a pretty good idea, satisfying the demand for "fast food" fertilisers and reducing transport costs into the bargain. The acid-treated phosphates don't suffer any nutritional degradation as a result of the refining process. Instead the problem is related to the stability of the treated phosphates. Phosphate has a triple negative charge and calcium has a positive charge, and, as a result, the two elements are naturally drawn together. This is why they are always found together naturally as **tri-calcium phosphate**.

The acid treatment may successfully break the bond between these two, but it is the aftermath of the separation that should have been researched more thoroughly. Perhaps it has been, but growers have never been properly informed of the results. **The fact is that the separation never lasts long after the phosphate hits the dirt.** The reunion is rapid and conclusive. In most soils the phosphate and calcium have reunited as insoluble tri-calcium phosphate ***within two to three months***. This reunion is particularly costly – not only is a large percentage of the phosphate lost, but **calcium** is also removed from the nutrient pool in the process.

All of the chemically produced phosphates suffer from this major problem, but **triple super** is by far the worst offender. Lab tests reveal that only 15% of this high analysis phosphate is actually utilized as soluble phosphate before the inevitable reversion to the insoluble form. It may be cheaper to transport the concentrated phosphates, but it isn't much of a bargain when you only end up with a fraction of what you paid for.

There is a major difference between colloidal soft rock phosphate and the chemical phosphates. The difference is in that word **"colloidal"**. This form of phosphate does not "tie up". The phosphate, calcium, and trace elements are actually complexed into the clay colloid. They will never lock-up and they are available for a considerable period of time, as the plant needs them.

What about the price comparison?

There are two approaches to the application of soft rock. We prefer a single **500kg per acre application**. This will provide adequate phosphate for up to **6 years**. Alternatively, **Nutri-Phos** can be applied at lighter rates ranging upwards from **100kg per acre** on a yearly basis.

The advantage of the single, larger application is that in situations where trace elements are markedly deficient, the remineralising capacity of Nutri-Phos will be particularly beneficial. **500kg per acre** will obviously provide more of the deficient elements to address the problem.

Nutri-Phos includes 10% phosphorus, 24% calcium, 26% silica, 2% iron, and a rich load of trace elements. The bulk price is **$300.00 per tonne** excluding GST for customers at Young. Nutri-Phos is also available in 1 tonne bags and 25kg bags.

The Forgotten Nutrient

Nutri-Phos is much more than just a phosphate source. One other element that should be mentioned in relation to Nutri-Phos is **silica**. This element has been receiving considerable attention recently, with the publication of two books describing the many benefits of this forgotten nutrient. It appears that silica has a surprisingly large number of functions in plants. Researchers are still "discovering" them, but the following findings can be reported from the published research data:

1. Silica **increases the breakdown of sugar**, giving the plant more energy and growth.
2. Silica **decreases the transpiration rate**, providing more efficient water use.
3. Silica can **decrease toxicity** through its capacity to regulate the uptake of excess **iron, magnesium, and aluminium**.
4. Silica **increases the rate of photosynthesis** in **sugar cane**. In fact, sugar cane trials have been quite spectacular, with **increased vigour, growth, and yield** – both dry weight (50% increase) and sugar (15 to 31% increase).
5. Silica **improves reproduction**, with more seed and heavier fruiting in a wide variety of species.
6. Silica **provides disease protection** through strengthening epidermal cells, which can produce quite dramatic resistance against a wide variety of fungi that attack leaves and stems.

Nutri-Phos contains exceptional levels of biologically available silica (26%).

More minerals than rock minerals!

The **trace element** levels in Nutri-Phos are another impressive feature. Nutri-Phos contains up to five times more major and minor elements than found in the commercial **rock mineral fertilisers** and yet, those products are comparably priced. In this context, Nutri-Phos stands alone. It is the only comprehensive source of every element known to man (excluding nitrogen) and can deservedly be called a “one shot wonder”.

Phosphorus – when you need it!

Perhaps the single most important attribute of Nutri-Phos involves the product’s ongoing plant-availability. The popular fertilising approach involving a single application of the acid phosphates at the start of the season has severe limitations in light of the lock-up problems already discussed. Phosphate is the governor of quality. **Nutritional value, taste, and shelf-life** are all directly related to phosphate availability. In many crops, particularly those involving more than 90 days maturity time, the majority of the initial chemical phosphate application is tied up and unavailable when it is needed most. This is not the case with Nutri-Phos colloidal phosphate. In orchard situations, for example, phosphate is desperately required to ensure higher sugar and mineral content during the entire fruit formation phase. Nutri-Phos maintains these levels during this crucial period.

Soft Rock vs Heavy Metal

Any discussion of the relative merits of phosphate inputs must necessarily include environmental and health considerations. There is an increasing awareness of the dangers of heavy metal contamination amongst many growers. We are often asked about cadmium levels in our product, because rock phosphate, the source of all chemical phosphates, is notorious for heavy concentrations of cadmium. **Nutri-Phos Soft Rock Phosphate has no cadmium problem.** It is, in fact, one of the cleanest sources of phosphate available.

The rock phosphate, used in the manufacture of super phosphate in the various concentrates, is imported. Unfortunately cadmium rears its ugly head when these products are analysed. Chemical gypsum, the by-product of the refining process, has proven the worst offender to date. In fact, it appears likely that this product will be removed from the market in the not too distant future. All of the acid treated phosphates suffer to some degree from cadmium contamination.

Cadmium is the most toxic of all the heavy metals. It has a tendency to accumulate in both leaf and root vegetables and can contribute to serious health problems for livestock and humans. The musical analogy is appropriate here. Soft rock music is gentle and appealing, but the heavy metal, head banging alternative is counterproductive for both health and well-being.

Soft rock phosphate, then, is one of the very few ethical alternatives that don’t involve a financial penalty. **In contrast, Nutri-Phos provides those who consider the environment a just reward for their efforts.**

Phosphorous in action

The feedback from our many clients has been exceptional. **Cane growers** claim that soft rock can provide an increase of two CCS points on top of gross tonnage increases. **Citrus growers** report dramatic growth flushes and improvement in fruit quality. **Small crop growers** report healthier more vigorous crops. **Peanut farmers** report increased drought resistance and better crops and results with **improved pasture** have been exceptional.

The only problem we have encountered to date has been related to the 6 to 8 week “kick in” time required for soft rock to provide phosphate release. If the product is applied directly at pre-plant, then a little starter phosphate is often required until Nutri-Phos kicks in.

Autumn is Soft Rock time

Sustainable agriculture sometimes requires a change in perspective. In an atmosphere where the chemical soluble reigns supreme, an expectation of rapid response has developed. **Nutri-Phos** is a demonstrably more stable product than any of the phosphate alternatives. It is competitively priced, more sustainable and it provides much more than just phosphate. However, if you are growing a 90 day crop, then a little foresight is required to ensure phosphate availability.

For many crops the ideal time for applying Nutri-Phos is autumn. If a green manure crop is feasible, then the soft rock will help maximise the benefits of that cover crop during winter, and the time frame involved will allow for the full release of all Nutri-Phos elements in time for a productive spring.

Autumn is soft rock season. Escape from the fast food mentality and plan ahead this season. Cover crops, microbes, soft rock and humates at pre-plant will ensure a soil preparation which really gets things cooking. Feed the soil. Give something back to the medium, which sustains us all, and the rewards will be manifold.

- Soft Rock Update October 2004 -

Nutri-Phos Soft Rock Colloidal Phosphate has now been applied on all soil types in New South Wales and Victoria over the past three seasons. *Where Nutri-Phos has been incorporated with other Life-Force® components, Nutri-Mate Organic Humates, Volcanic Basalt Sand and inoculated with Nutri-Life 4/20 beneficial bacteria and fungi, there have been unprecedented increases in* ***available phosphorous****.*

Broadacre crops, fruit, vegetables, and pasture have also produced better outcomes. High yields are being maintained with significant improvements in crop vitality and disease and pest resistance. These practical in-field outcomes mirror the luxury levels of available phosphorous showing on soil analysis taken following the Life-Force® approach.

The product has been applied on its own at typical broadacre rates of 100 to 130kg/ha and has been a part of some very successful crops. Utilising the Life-Force® program builds soil structure. The increased nutrient availability that this fertility program is capable of achieving can and is replacing regular annual applications of phosphorous in cropping. Nutri-Phos colloidal soft rock phosphate is an important part of the significant improvement in soil structure and fertility improvements that have been observed over the past four seasons.

Nutri-Phos application guidelines for broadacre cropping and pasture:

In conjuction with other Life-Force® products described above, a typical three year fertility improvement plan will include:

Year 1 and 2	*Nutri-Phos……70-140 kg per ha*
Year 3	*Nutri-Phos……..35-70 kg per ha*

There are now examples of very successful crops grown in South Australia on well-structured soils without any phosphorous application required

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