

Product Information Sheet

SurePhos

SurePhos is an environmentally friendly phosphorus and sulphur fertiliser. Most of its phosphorus is water insoluble and slowly releases over a period of months, significantly reducing losses to the environment and allowing SurePhos to be confidently used in a wide range of conditions while still meeting plant requirements.

SurePhos	
Phosphorus	7.8%
Water soluble	1.8% ($\leq 23\%$ total P)
Citric acid soluble	5.6% ($\geq 70\%$ total P)
Sulphur	9.5%
Calcium	22%
Magnesium	2%
Bulk density	1.3 kg/L
Fertmark registered	Yes
Modelled in MitAgator	Yes

SurePhos is manufactured using reversion, a process that converts water soluble phosphate into the more stable citric acid soluble phosphate. Citric acid soluble phosphate levels indicate how much phosphate will become available over time. When applied in the paddock, microbial activity and soil chemical processes gradually convert this phosphate back into water soluble phosphate that is readily available to plants.

This means when SurePhos is applied in the paddock, its formulation reduces the amount of phosphorus lost to surrounding environments. It also provides a product with a higher concentration of phosphate, that is free flowing and able to be spread evenly and accurately. In addition, it can be custom blended with nitrogen and other fertilisers.

SurePhos's unique manufacturing process stabilises it. Acid is added to phosphate rock to produce water soluble monocalcium phosphate before it is reverted to produce a more stable, less water soluble dicalcium phosphate.

Features of SurePhos

Slow release, environmentally friendly phosphate

SurePhos gradually releases phosphate into soil, resulting in more phosphorus retained in the soil and less lost to the environment.

More than 70% of the phosphorus in SurePhos is citric acid soluble and can be utilised by pasture within a year. A maximum of 23% is water soluble and is able to be utilised by pasture on application. This reduces phosphorus loss from runoff and leaching by up to 75%¹. In a lab trial, SurePhos was shown to reduce phosphorus leaching by up to 83%². These features make it ideal for use in catchments with phosphorus limited waterways (inherently low phosphorus levels) and in other sensitive catchments.

Cost effective

SurePhos has a high phosphorus content for a reverted phosphate fertiliser. With less product required, cartage and spreading costs are lower, making SurePhos cost effective compared to other reverted phosphorus fertilisers.

Flexible application

The risk of phosphorus loss is particularly prevalent following application in high risk conditions – less than two weeks before irrigation or heavy rainfall (an average of 30 mm within 21 days). The slow release nature of SurePhos gives flexibility of application, with less risk of nutrients being washed away and lost via surface runoff (see Figures 1 and 2).

Better spreading

SurePhos granules are round and free flowing, allowing it to be spread evenly and accurately.

Compatible

SurePhos can be blended with other fertilisers for maintenance or capital use. This helps minimise the number of applications and pasture damage.

SurePhos granules are round and free flowing.



Using SurePhos

Uses

SurePhos is a particularly useful fertiliser for New Zealand soils, which are inherently low in both phosphorus and sulphur. It can be used as a capital fertiliser to increase soil phosphorus levels and provide sulphur, or applied annually as a maintenance fertiliser to replace losses of phosphorus and sulphur that occur throughout the farming year. SurePhos can also be used to lift phosphorus levels prior to crops going in when sufficiently applied in advance.

Application

SurePhos is suitable for broadcast application by ground spreading or by aerial topdressing. It is not suitable for drilling.

Blending with Sustain

The reduction of free acid in SurePhos means SurePhos and Sustain blends are stable for up to 48 hours. In addition, SurePhos and PhasedN blends are stable for up to 6 weeks.

Safety

Dust: Good granulation processes during manufacturing mean that the level of dust in SurePhos is kept to a minimum. However, dust can accumulate during the transport and handling of the product. This dust should be treated as a hazard during distribution and spreading. Wear suitable protective clothing, including gloves, and avoid breathing the dust.

Cadmium: All fertilisers that are made from naturally occurring phosphate rock contain some level of cadmium. SurePhos conforms with the New Zealand fertiliser industry standards, and contains less than 150 mg cadmium/kg phosphorus (equivalent to 12 mg cadmium/kg SurePhos). Cadmium can accumulate in soils and enter the food chain through vegetables and animal organ tissue. On farms with high soil cadmium levels, cadmium-free fertilisers may need to be used.

Fluoride: All superphosphate fertilisers contain less than 270 g fluoride/kg phosphorus. Fluoride is toxic to grazing animals and can cause stock deaths, especially when animals are under stress. Animals ingest fluoride if fertiliser has stuck to foliage. To avoid animal health issues arising from fluoride poisoning after applying SurePhos, avoid grazing pastures until 25 mm of rain has fallen, which will wash any fertiliser residues off foliage and into the soil.

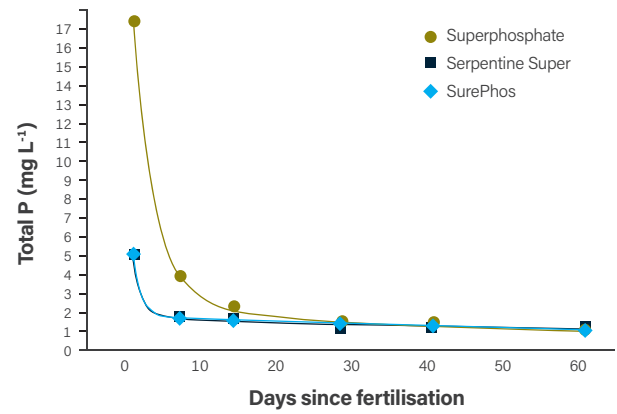


Figure 1. Concentration of Total P in runoff following the application of 30 kg P per hectare as different fertiliser forms. Soil ASC = 26%. Graph modified from Orchiston and McDowell, 2019.³

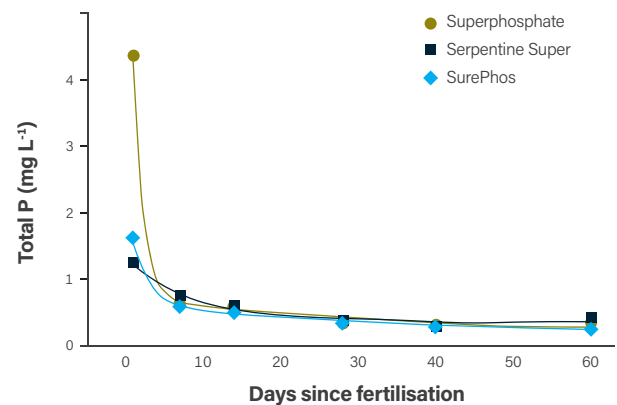


Figure 2. Concentration of Total P in runoff following the application of 30 kg P per hectare as different fertiliser forms. Soil ASC = 85%. Graph modified from Orchiston and McDowell, 2019.³

How phosphorus is lost

When applied in the right conditions, losses from fertiliser are estimated to make up less than 10% of total phosphorus losses. Most phosphorus is lost via runoff carrying phosphorus bound to soil particles. Phosphorus does not normally leach, as most soils have a moderate to high ASC, so it instead binds with minerals on soil particle surfaces. Coarse textured soils with very low ASC that are exposed to reasonable annual rainfall have the highest risk of phosphorus leaching.

When phosphorus is applied to land, around 80-90% is eventually used by plants, with around 10-20% ultimately lost. However water soluble phosphate fertilisers such as superphosphate or diammonium phosphate (DAP) can, via runoff, contribute up to 90% of total phosphorus losses from pasture if spread too close to waterways or applied during high risk periods of rainfall.

References

- ¹ Gillingham A, 2018. A review of literature measuring loss of phosphorus from recently applied fertilizer by water runoff soon after topdressing pasture: Report to Ballance AgriNutrients by A Gillingham, Agricultural Research Consultant, November 2018.
- ² Dexter M, Kear M, Lucci G 2019. P leaching from SurePhos, Superten and Serpentine Super fertilisers in a laboratory evaluation: Report prepared for Ballance Agri-Nutrients by AgResearch Limited
- ³ Orchiston T, McDowell RW 2019. Phosphorus (P) losses in runoff from four P fertilisers of contrasting water-soluble P contents: Report prepared for Ballance Agri-Nutrients by AgResearch Limited