

which soils are at risk of sulphur leaching?

Many soils in New Zealand are naturally low in sulphur and this deficiency is made more difficult as soils do not have a great capacity to store this nutrient. Sulphur may be stored in the organic form, or in an inorganic form e.g. sulphate sulphur, elemental sulphur.

Sulphate sulphur can be lost by leaching, as it is not stored in soils to the same extent as phosphate. The risk of leaching depends on soil type and soil properties.

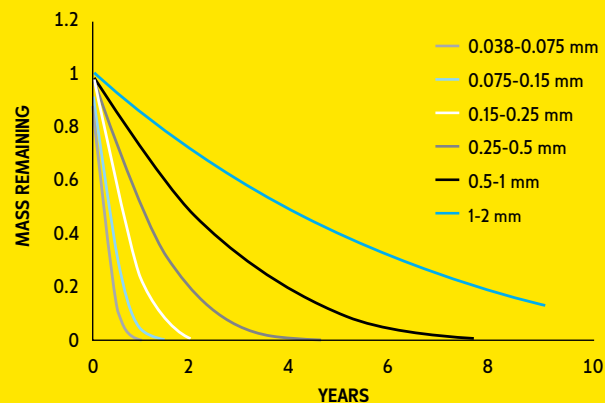
High-risk soil groups are: pumice, peats, podzols and weakly weathered sedimentary soils (e.g. recent and pallic).

High-risk soil properties are: low extractable organic sulphur (EOS) (<10), low total sulphur (<600 mg/kg), low anion storage capacity (ASC) (<60), high rainfall (>1500 mm), high permeability to water and coarse texture.

how long will elemental S persist in soil?

Four factors drive the rate of conversion of elemental S to plant-available sulphate S: soil moisture, soil temperature, the presence of *Thiobacillus* bacteria, and most importantly, particle size. The larger the particle size, the slower the oxidation. In North Island conditions, 90 percent of elemental S particles less than 0.5 mm in diameter will be converted into sulphate S within two years.

Oxidation rate of various elemental S size grades



Complete S for continuous growth

Along with S, sulphur gain supplies phosphorus (P) and calcium (Ca), and can be blended with potassium (K) and trace elements to meet farm-specific needs.

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sulphur gain™



the facts about sulphur gain

sulphur gain is a superphosphate-based fertiliser that contains additional sulphur (S), an important element for pasture health. This S is present in two forms, rapidly released sulphate S and slowly released elemental S, so providing both a short-term and long-term supply to plants.

Made in New Zealand from high-quality raw materials sourced overseas, **sulphur gain** is suitable for the majority of farm types throughout the country. It is particularly beneficial on soils prone to S loss and land that does not receive annual applications of fertiliser. It can be used for capital or maintenance fertiliser applications.

on-farm benefits

The inclusion of elemental S in **sulphur gain** makes the product ideal for use in autumn, as this form of S will persist through the cool, wet winter months. In spring, as soils warm up, the elemental S will be released by the action of natural soil bacteria, which convert it into the plant-available sulphate form. **sulphur gain** is ideal for use in inland S-deficient areas, and in situations that promote S leaching i.e. in districts that have a high rainfall and soils with a low anion storage capacity (ASC).

The P in **sulphur gain** is present mainly as water-soluble phosphate, with over 80 percent of the P being in this form. Water-soluble phosphate is immediately available for plant uptake, so **sulphur gain** is ideal to use when you need to rapidly boost soil P levels, or when you want to be certain that plants have ready access to sufficient P to support their requirements.

Another benefit of using **sulphur gain** is that it helps add Ca to the soil. Although Ca deficiency in New Zealand soils is virtually unknown, adding Ca in **sulphur gain** helps to offset losses that occur through leaching.

sulphur gain is not suitable for drilling down the spout with seed as it contains a small amount of residual acid. Elemental S does have a natural tendency to lower soil pH over time, but it typically takes about 300 kg elemental S/ha to reduce soil pH by 0.1 unit. Annual soil tests will reveal whether or not a lime application is necessary. In general, the long-term boost to pasture production and clover growth outweighs any soil acidification resulting from the use of elemental S.

storage and spreading

sulphur gain is compatible with a wide range of other products, including potash and trace elements. It should not be mixed with nitrogen products such as urea and DAP, as there is a risk of the mix becoming wet and lumpy, which will lead to spreading difficulties and may cause crop striping.

Mixes with Calmag or lime should be avoided, as heat generation and reversion may occur, which could cause spreading difficulties. This will not affect the amount of P available, but will result in it being released more slowly once applied to the land.

sulphur gain is suitable for groundspread or aerial application. For aerial top-dressing, the elemental S content must not exceed 30 percent.

To maintain product quality, **sulphur gain** should be stored in cool, dry conditions.

specifications

Bulk density	1.1 - 1.2 kg/l
Particle size range	1-4 mm - at least 60 percent <0.5 mm - <5 percent
Crushing strength	2 kg
Moisture level	7 percent
Fluorine content	<270 g/kg P
Cadmium content	<280 mg/kg P

product range	N	P	K	S	Mg	Ca
sulphur gain 15S	-	8.5	-	14.7	-	21
sulphur gain 20S	-	8.1	-	20.0	-	20
sulphur gain 30S	-	7.0	-	29.5	-	17
sulphur gain 50S	-	5.4	-	45.8	-	13
15% Potash Sulphur Super (7K)	-	6.8	7.5	17.0	-	17
20% Potash Sulphur Super (10K)	-	6.4	10.0	16.0	-	16
30% Potash Sulphur Super (15K)	-	5.6	15.0	14.0	-	14
50% Potash Sulphur Super (25K)	-	4.0	25.0	10.0	-	10
Durasul Sulphur	-	-	-	95.0	-	-

application guidelines	use	rate (kg/ha)
sulphur gain 15S	S responsive areas	200-500
sulphur gain 20S	Capital S fertiliser programmes	200-500
sulphur gain 30S	Capital S programmes in high-loss soil environments with low P requirements	200-400
sulphur gain 50S	Biennial or triennial hill country fertiliser programmes	200-400
15% Potash Sulphur Super (7K)	General purpose, maintenance for sheep and beef in low K & S soils	300-500
20% Potash Sulphur Super (10K)	General purpose, dairy maintenance	300-500
30% Potash Sulphur Super (15K)	Capital K for sheep and beef farms, spring dairy application	300-600
50% Potash Sulphur Super (25K)	Conserved feed post-harvest	200-400
Durasul Sulphur	'Add in' product where slow-release release S is required	30-100

Soil S levels are naturally highest in summer and autumn, and lowest in spring.



Research shows an annual application of 25-30 kg S/ha is sufficient to overcome S deficiency on most soils.

sulphur gain can encourage better clover growth and increase nitrogen fixation in pasture.



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