



Fertilizing Rice with Polysulphate



Functions of S, K, Mg and Ca and in rice cultivation

- Sulphur (S) is essential for the synthesis of three of the amino acids that make up proteins. Sulphur is a constituent of vitamins such as thiamine and biotin, and coenzyme A, and is involved in chlorophyll formation, and carbohydrate metabolism. Sulphur also increases nitrogen use efficiency.
- Potassium (K) activates various enzymes for processes such as photosynthesis, respiration, carbohydrate metabolism, protein synthesis and osmotic regulation. Potassium improves plant tolerance to pests and diseases, is essential for efficient use of nitrogen, increases foliar area, reduces lodging and improves quality of spikes and grains.
- Magnesium (Mg) is fundamental for photosynthesis as a central part of the chlorophyll molecule. Magnesium activates carbohydrates and protein synthesis and is essential for phosphate transport.
- Calcium (Ca) is a very immobile element inside the plant, important for building cell walls, foliar lamina and root development. Calcium reduces susceptibility to diseases and stress conditions, decreases respiration and increases both photosynthesis and absorption and utilization (efficiency) of N and K.

Practical guidelines for fertilizing rice with Polysulphate

- The amounts of nutrients removed by rice crops vary considerably with each variety and management system depending on the soil and planting seasons.
- Polysulphate is a sulphate-based source of available K, Mg and Ca with low chloride content.
- At the right dose, Polysulphate supplies all the S needed by rice, and a significant proportion of K, Mg and Ca removed at harvest, without affecting the soil pH.
- It is recommended that Polysulphate is applied at planting or during the first fertilizations to allow the prolonged release of nutrients and continuous supply of S, K, Mg and Ca throughout the crop growth period.
- For balanced rice nutrition, dose rates between 150 and 200 kg/ha of Polysulphate are suitable to complement current fertilization plans.
- These doses improve crop yield and can be applied with other NPK and micronutrient sources.

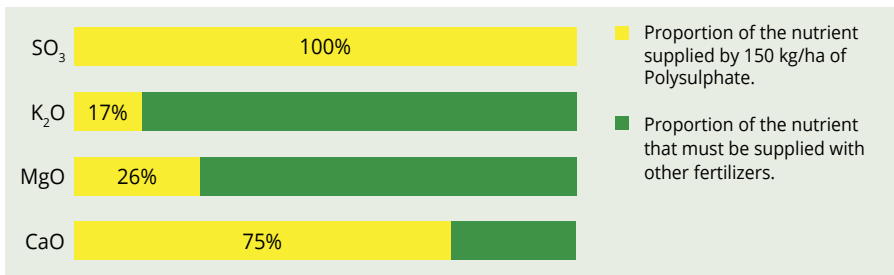


Estimated nutrient offtakes (removal) by rice

Nutrient	Offtakes (kg/t)	Offtakes (kg/ha)	
		6 t/ha	10 t/ha
N	17.5	105	175
P ₂ O ₅	6.9	41	69
K ₂ O	20.5	123	205
SO ₃	4.5	27	45
MgO	5.8	35	58
CaO	5.6	34	56

Adapted from Dobermann & Fairhurst (2000)

Nutrients supplied by 150 kg/ha of Polysulphate fertilizer for a 6 t/ha rice harvest



Expected benefits of Polysulphate use

- Balanced nutrition
- Increased nutrient efficiency
- Higher tillering, yield and grain quality
- Increased tolerance to biotic and abiotic stresses



48% SO_3
(19.2% S)



14% K_2O
(11.6% K)







6% MgO
(3.6% Mg)



17% CaO
(12.2% Ca)

Mined in the UK, ICL is the first – and only – producer in the world to mine polyhalite, marketed as Polysulphate.

Polysulphate 

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