



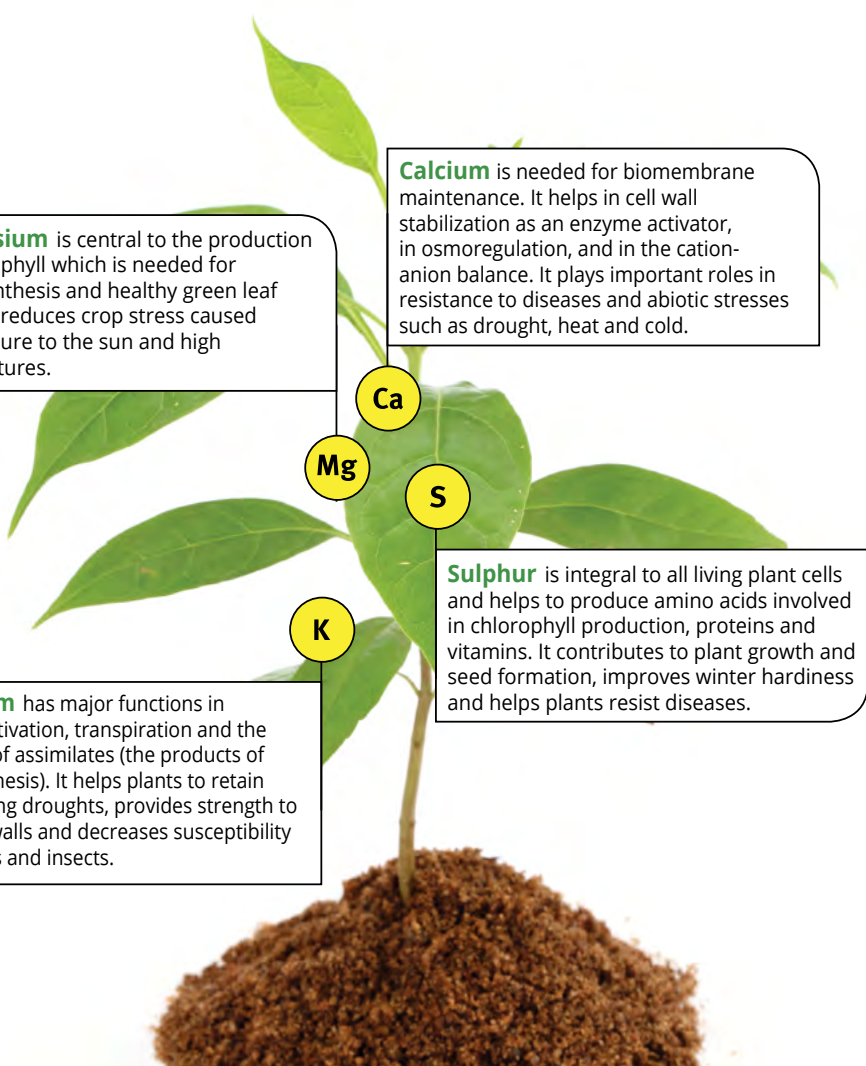
Fertilizing
Soybean (*Glycine max*)
with Polysulphate



Polysulphate main characteristics

- Natural mineral (polyhalite), containing 19.2% S, 14% K₂O, 6% MgO and 17% CaO all in sulphate form, with mobility in the soil profile.
- Prolonged release, lowers risk of nutrient loss through leaching.
- All the nutrients are fully available to the growing plant.
- Low chloride content, low salt index, and neutral pH.

How the four essential nutrients in Polysulphate benefit plants



Magnesium is central to the production of chlorophyll which is needed for photosynthesis and healthy green leaf tissue. It reduces crop stress caused by exposure to the sun and high temperatures.

Calcium is needed for biomembrane maintenance. It helps in cell wall stabilization as an enzyme activator, in osmoregulation, and in the cation-anion balance. It plays important roles in resistance to diseases and abiotic stresses such as drought, heat and cold.

Potassium has major functions in enzyme activation, transpiration and the transport of assimilates (the products of photosynthesis). It helps plants to retain water during droughts, provides strength to plant cell walls and decreases susceptibility to diseases and insects.

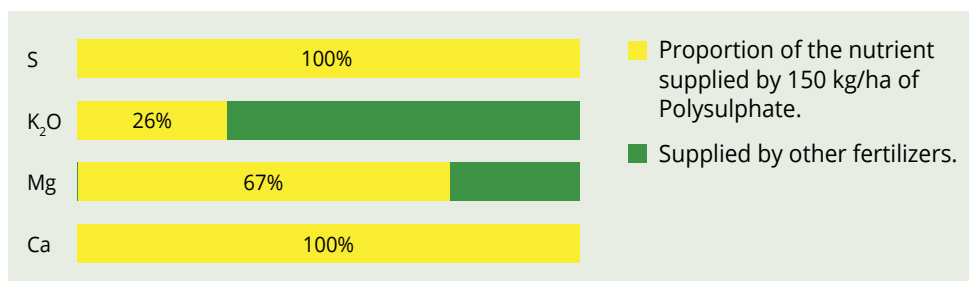
Sulphur is integral to all living plant cells and helps to produce amino acids involved in chlorophyll production, proteins and vitamins. It contributes to plant growth and seed formation, improves winter hardiness and helps plants resist diseases.

The nutrient uptake required by crop to produce 1 t soybean, and offtake at harvest

	S	K ₂ O	Ca	Mg
	kg nutrients / 1 t soybean			
Uptake	16	58	22	11
Offtake	4	22	3	3

Source: *Tecnologias de produção de soja, 2020*

Nutrients supplied by Polysulphate at recommended dose (150 kg/ha) in furrow or broadcast to a 4 t/ha soybean crop



Expected benefits of Polysulphate

- Healthier plants with better resistance to pests, diseases and drought
- More use of nitrogen (N) in biological fixation
- Better photosynthetic rate
- Increased grain weight
- Higher yields





Left: MAP+SSP+KCl (80 kg/ha K_2O + 25 kg/ha S + 35 kg/ha Ca).

Right: MAP+Polysulphate+MOP (80 kg/ha K_2O + 25 kg/ha S + 15 kg/ha Ca + 5 kg/ha Mg).

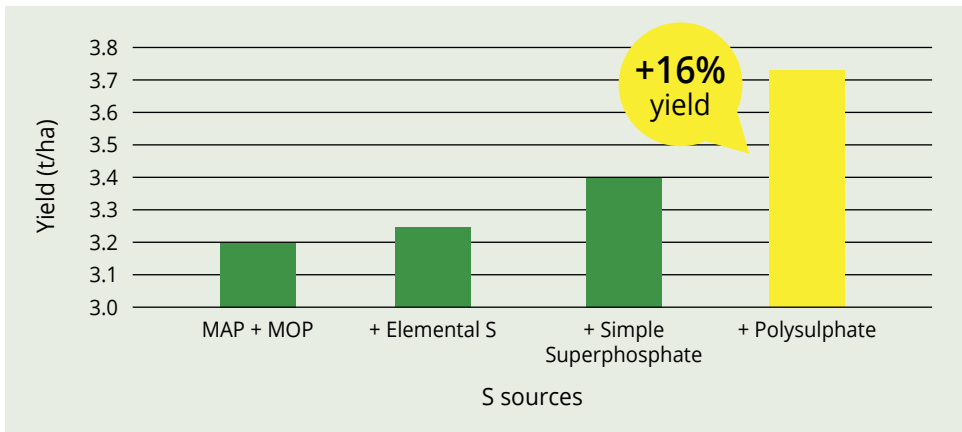
Rio Verde Foundation, Lucas do Rio Verde-MT, Brazil (2016/17 harvest).

Advantages of using Polysulphate in soybean crop

- Combines better nutrition with higher operational performance.
- Corrects common calcium and magnesium deficiencies in no-tillage systems ensuring plants are more resistant to drought.
- Reduces risk of potassium-induced calcium and magnesium deficiencies.
- Prolonged release provides more time for the plants to take up the nutrients throughout the growth period, while reducing risk of leaching.
- Low salt index, due to very low amounts of chloride and sodium.
- Provides better root growth and higher Rhizobia development for nitrogen fixation.
- Polysulphate is versatile: use it straight or in blends for furrow or for broadcast fertilization.

Main research results with soybean

- Polysulphate application proved highly viable as a source of sulphur for fertilizing soybean.
- More than 16% increase in productivity was observed in comparison to fertilization without sulphur.
- Compared to other sulphur sources, the increase in productivity with Polysulphate ranged from 9.5 to 14%.



All treatments contained 80 kg/ha P_2O_5 , 80 kg/ha K_2O and 25 kg/ha S, except for the control treatment (MAP + MOP) where no S was applied.

Rio Verde Foundation, Lucas do Rio Verde-MT, Brazil (2016/17 harvest).



Soybean leaf with potassium-induced Mg deficiency, from an area without Polysulphate fertilization. Rio Verde Foundation, Lucas do Rio Verde-MT, Brazil (2016/17 harvest).



S

48% SO₃
(19.2% S)



K

14% K₂O
(11.6% K)



Mg

6% MgO
(3.6% Mg)







Ca

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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