Fertilizing Banana

with Polysulphate

ICL

Polysulphate S K Mg Ca

Functions of S, K, Mg and Ca in banana crops

- Sulphur (S) is an essential enzyme constituent for the synthesis of three of the amino acids which make up true proteins. It is involved in chlorophyll formation, and carbohydrate anabolism and metabolism. It also increases nitrogen use efficiency. The deficiency symptoms appear in young leaves that turn yellow, and may exhibit necrotic spots in margins and thicker secondary veins, producing small and malformed bunches.
- Potassium (K) activates various enzymes for processes such as photosynthesis, respiration, carbohydrate metabolism, protein synthesis and osmotic regulation. K increases foliar area, number and weight of bunches, sugars and reduces fruit acidity, improving banana quality. K is essential for efficient use of nitrogen and improves plant tolerance to diseases. Yellow leaf borders that finish in necrosis of old leaves, which curve towards the pseudostem, indicate K deficiency symptoms.
- Magnesium (Mg) is fundamental for photosynthesis as a central part of the chlorophyll molecule. Mg activates carbohydrate, fat, protein and phosphate transport, while also increasing sugar formation. Leaves with green margins and chlorosis near the middle vein are indications of Mg deficiency.
- Calcium (Ca) is a very immobile nutrient inside the plant, important for building cell walls, foliar lamina and fruit peel. Ca increases tolerance to diseases and stress conditions, it reduces respiration and increases photosynthesis as well as K and N uptake and utilization (efficiency). The symptoms of deficiency are spiky leaves with malformed or absent foliar lamina.

Practical guidelines for fertilizing banana with Polysulphate

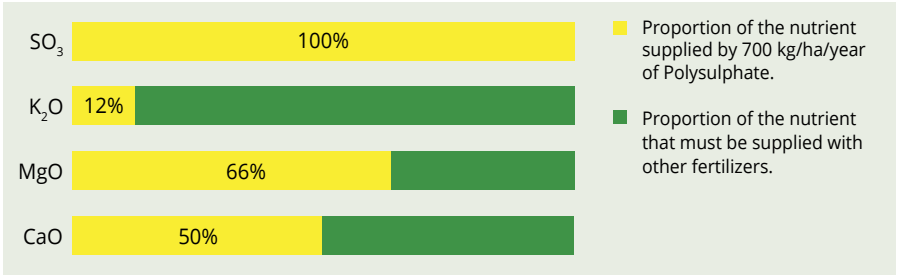
- Polysulphate is a sulphate-based source of water available K, Mg and Ca, with low chloride content.
- At the right dose, Polysulphate supplies all of the S needed by the plant, and a significant proportion of the K, Mg and Ca that is removed at harvest, without affecting the soil pH.
- A large amount of K is removed at banana harvest; the proportion not supplied by Polysulphate can be applied as muriate of potash (KCl).
- It is recommended to split application of Polysulphate during rainy periods or below irrigation lines, allowing prolonged release and continuous supply of S, K, Mg and Ca during a longer crop growth period.
- For balanced banana nutrition, rates between 600 and 800 kg/ha of Polysulphate are suitable to complement the current fertilization plans.
- These rates improve crop yields and can be broadcast with other NPK and micronutrient sources, and split based on soil texture and CEC.

Estimated nutrient offtakes (removal) by banana

Nutrient	Offtakes (kg/t fresh fruit - ff)	Offtakes (kg/ha)	
		40 t ff	60 t ff
N	7.10	284	426
P_2O_5	0.58	23	35
K_2O	20.21	808	1213
CaO	5.94	238	356
MgO	1.60	64	96
SO_3	1.52	61	91

Research Data INIAP-IPI (2020)

Nutrients supplied by 700 kg/ha of Polysulphate fertilizer for a 40 t/ha banana harvest



Expected benefits of Polysulphate use

- Balanced nutrition
- Increased nutrient use efficiency
- Higher yields
- Increased size and weight of fruit and bunches
- Higher tolerance to biotic and abiotic stress

S 48% SO_3 (19.2% S)

K 14% K_2O (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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