

MULTI-NUTRIENT FERTILIZER DEMAND IN LATIN AMERICA



poly4.com



MEETING THE CHALLENGE OF NUTRIENT DEFICIENCIES

POLY4 is a naturally-occurring, low-chloride, multi-nutrient fertilizer. It includes four of the six key macro nutrients that all plants need to grow: potassium, sulphur, magnesium and calcium.

Magnesium and sulphur deficiencies across the world are growing.

Sulphur alone accounts for a

plant nutrient

deficiency of an estimated 60 Mtpa in POLY4 equivalent.

Widespread soil deficiencies in Latin America create a significant market opportunity for POLY4 to be a valuable NPK feedstock supplying K_2O , sulphur and magnesium and meeting Cl-free demand in certain circumstances.

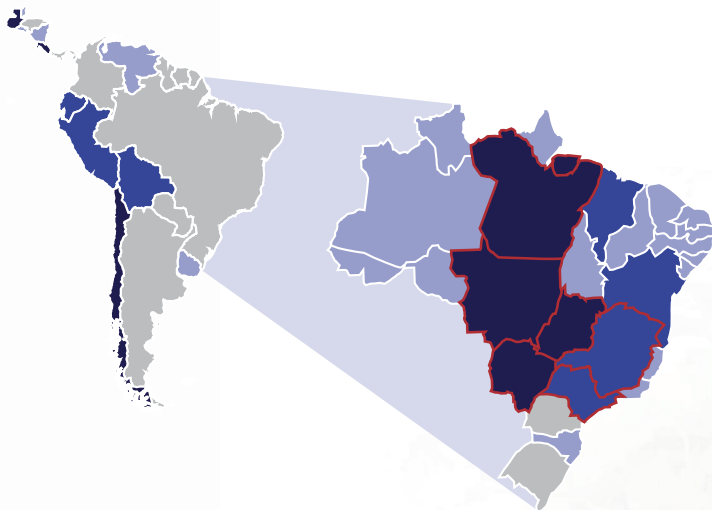
POLY4 is a low-cost source of potassium, magnesium and sulphur readily available for plant uptake.

Sulphur deficiencies (unmet demand)
(based upon The Sulphur Institute 2015 estimate
in Latin America in million tones per annum
in POLY4 product terms)







REGIONAL SOIL CHALLENGES AND DEFICIENCIES IN BRAZIL

Old, eroded, acidic soil is common in parts of Latin America and bears high levels of aluminium, which can be toxic. The addition of sulphate, as delivered by POLY4, helps to remove excess aluminium from crop root zones, thus improving crop and human health.



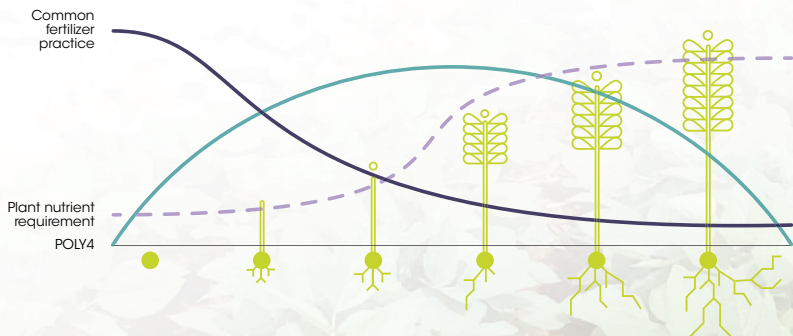
REGIONAL SOIL CHALLENGES

-  High agricultural activity and significant deficiencies
-  Deficient in one nutrient supplied by POLY4
-  Deficient in two nutrients supplied by POLY4
-  Deficient in three nutrients supplied by POLY4

EFFECTIVE NUTRIENT RELEASE PROFILE

Long-term leaching means many Latin American soils are low in nutrients, and low soil pH restricts availability of many nutrients. POLY4's nutrient release profile aligns more closely with a plant's nutrient requirements. It can sustain existing crops and improve nutrient legacy to enhance sustainability.

NUTRIENT DELIVERY PROFILE (COMMON FERTILIZER PRACTICE VERSUS POLY4)



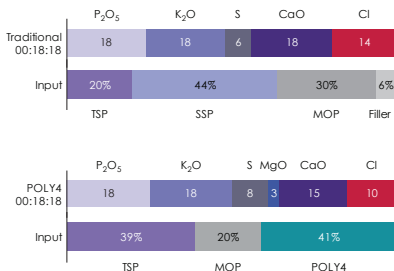
POLY4's
MULTI-NUTRIENT
PROPERTIES
HELP FARMERS
INCREASE YIELDS

POLY4 IS IDEAL FOR NPK BLENDING

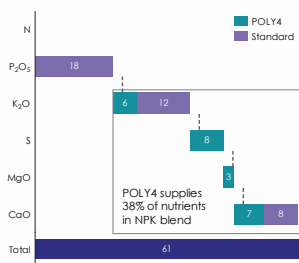
NPK fertilizer consumption forecast indicates that the average annual growth rate (calculated over six years) for Latin America is double the predicted global growth rate: 3% versus 1.5%. The region is forecast to become the third largest consuming region globally.

POLY4 is a unique feedstock for blends, supplying four out of the six macro nutrients essential for plant growth. It is ideal for NPK blending – it can reduce blenders' input costs and improve farmers yields.

00:18:18 NPK COMPOSITION (% OF INPUT)



POLY4 ENHANCED 00:18:18 (NUTRIENT VALUE)



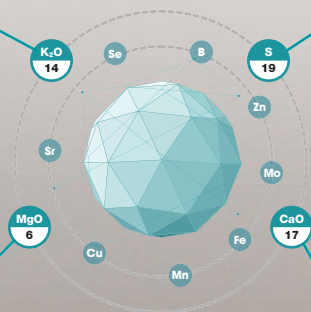
UNLOCKING LATIN AMERICAN FARMING POTENTIAL

POLY4 is the trademark name for polyhalite product from the Anglo American project in North Yorkshire, UK. It has no requirement for chemical processing and has the lowest CO₂ emissions compared to

other fertilizer products. Our product is an efficient and effective fertilizer that allows farmers to maximise their crop yield, quality and soil structure with one simple product.

Potassium – Latin American soils commonly require supplementation. Potassium aids plant metabolism, water regulation and drought stress, improves disease resilience and subsequently plant health.

Sulphur – an essential component of proteins, eg, enzymes. Yield and cereal protein content is reduced where sulphur availability is limited, especially with the leguminous crops.



Magnesium – a cofactor of many enzymes and key component of chlorophyll. A soluble magnesium source is of value in Brazil.

Calcium – important for soil stability and plant tissue integrity, particularly for cell structure and root cell wall nutrient transport.

POLY4 IS AN EFFICIENT AND SUSTAINABLE SOURCE OF SULPHUR

Sulphur is required to maximise yield. For example, Brazilian soybean (2.93 t ha^{-1} , Food and Agriculture Organisation, 2014-2016) needs at least $20\text{-}24 \text{ kg S ha}^{-1}$ to sustain average seed yield.

POLY4 is a sustainable and efficient source of sulphur readily available for plant uptake. It is a cost-effective alternative to SSP as a sulphur source in blends. POLY4 supplies sulphur and major nutrient cations to deficient crops thus increasing crop production.

Latin America: the regional challenges



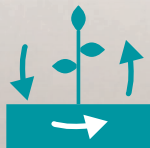
Overcoming
the sulphur
deficiency



Achieving
sustainable
productivity



Meeting the
multi-nutrient
fertilizer
demand



Improving
soil structure

RESEARCH AND DEVELOPMENT PROGRAMME IN BRAZIL

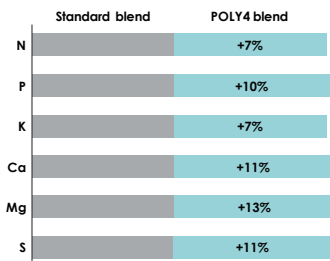
Brazil is projected to become the world's largest soybean producer by 2026 with production estimated to reach 135 million tonnes. The total crop area is forecast to increase by 24%, with soybeans driving most of this expansion.

The crop trial study by the University of São Paulo evaluated POLY4 in a commercial fertilizer programme for soybean in Brazil. The extremely positive results showed that the POLY4 blend achieved greater yield than the industry standard blend containing MOP-K.

The POLY4 fertilizer blend had greater macro and micro-nutrient uptake by the soybean:

- **Increased S uptake – supporting yield response;**
- **Increased K uptake – supporting yield response, crop health and potential improvement to root proliferation;**
- **Increased Ca uptake – encouraging balanced crop health;**
- **Improved N and P uptake with more taken by the crop – boosting efficient and sustainable fertilizer use increase.**

IMPROVEMENTS IN MACRO-NUTRIENT UPTAKE COMPARED TO THE STANDARD BLEND



IMPROVEMENTS IN MICRO-NUTRIENT UPTAKE COMPARED TO THE STANDARD BLEND

