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## POLY4- A GAME CHANGING FERTILIZER

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**T**his product made from mining polyhalite in coastal locations is known by the trademark name POLY4. The Crop Nutrients business corporation of Anglo American is responsible for marketing this product. Four of the six important macronutrients necessary for plant growth can be found in polyhalite, a naturally occurring fertilizer that has low levels of chloride and is multi-nutrient rich. For farmers, using POLY4 as a source of potassium, sulphur, magnesium, and calcium results in more effective fertilizer methods that are also more sustainable.

**Solubility:** All fertilizers are characterized by their solubility in water at a given temperature. The solubility of POLY4 was tested over a range of temperatures against the water solubility reported for other common fertilizers (Gangolli 1999). POLY4 has a solubility of 27 g L<sup>-1</sup> at 25°C, which corresponds to the amount of POLY4 that would dissolve in the plough layer of a moist soil at 3 times to potash application rate (NRM Laboratories 2014, 2015). With this solubility, POLY4 effectively delivers K, S, Mg and Ca at commercially-required rates.

Summary of commercial fertilizer solubility at 25°C (Gangolli 1999):

Fertilizer	Solubility at 25°C (g L <sup>-1</sup> )
<b>POLY4</b>	27
<b>MOP</b>	264
<b>Urea</b>	1200

**Dissolution Rate:** The rate at which a solid transitions into a solution is known as dissolution. As crucial as when to apply fertilizer is the availability of nutrients to plants.

According to the findings of many studies, nutrients were released from POLY4 granules in 40 hours (Elam et al., 1995).

**Nutrient Delivery Profile:** Nutrients including nitrogen, potassium and sulphur are frequently added as fertilizer during planting. When a plant is nearing the conclusion of its life cycle, when nutrient uptake is at its peak, these nutrients may have been lost due to erosion, runoff, or leaching. Crops grown on sandy soil and other soil types with low capacity to hold and release nutrients require sustained nutrient release more than other soil types. POLY4 offered a very potent and distinctive combination of prolonged K, S and Mg release that enables plants to benefit from this availability for a longer period of time, better meeting their needs.

### **Key Points of Choosing POLY4 over Another Fertilizer**

**a) POLY4 is an Efficient Multi-Nutrient Fertilizer:** According to trial results, POLY4 has improved nutritional absorption for both macro and micro nutrients. More nutrients being transported to the crop results in higher yields and higher crop quality, which is a major source of profit. In addition to lowering fertilizer and other farm input costs, POLY4's multi-nutrient features also assist farmers reduce nutrient waste by distributing nutrients over a longer period of time that is more in line with plant needs.

**b) POLY4 is an Effective Multi-Nutrient Fertilizer:** POLY4 increases yield, quality, and nutritional health by making a wider range of nutrients more readily available to plants. It can also reduce crop losses through disease resistance. These macro and micro nutrients also become accessible over a longer period of time, better fitting the plant's nutrient uptake cycle. All of the main input sources for NPK blending are compatible with POLY4, which is offered in granulated or standard form. A POLY4 mix may be stored for a lot longer than a regular NPK blend. Up to 36 metres away, this product spreads efficiently, eliminating uneven fertilizer application and a subsequent decline in crop yields (Chinese Academy of Sciences 2015).

**c) POLY4 is A Flexible Multi-Nutrient Fertilizer:** POLY4 avoids the toxicity problems typically connected with the use of high-chloride fertilizer sources because it is a low-chloride, multi-nutrient fertilizer. An improvement in the soil's chloride content is beneficial to several crops. Additionally, POLY4 has no negative impact on soil's electrical conductivity, which can be hazardous to crops.

**d) POLY4 is a Sustainable Fertilizer:** By making soil more resistant to compaction, erosion, and runoff, POLY4's calcium helps plants obtain the nutrients they require to grow. Applying the wide range of nutrients that POLY4 provides can increase the plant's access to soil-bound nutrients and stop nutrient mining, a frequent danger to the sustainability of agricultural production. Polyhalite's use leaves a little carbon impact and gives farmers a productive fertilizer option.

### Why we choose POLY4 in India?

- ✓ It is acknowledged that soils are deficient in potassium, sulphur, and magnesium.
- ✓ The current system of subsidies promotes nitrogen overapplication.
- ✓ Degradation of soil nutrients and the need for more balanced fertilisation.
- ✓ Low yields and poor fertilising methods.
- ✓ To lower chloride content, there is a demand for a balanced application.
- ✓ By supplying potassium, sulphate and magnesium in one product and enhancing nutrient delivery profile, POLY4 offers a corrective and environmentally responsible option.

### POLY4 –Global crop performance

**i) Rice-** Rice has the second highest worldwide production after corn. Between 2012 and 2016, global rice production increased by 4.7 Million metric tonnes (Mmt) and POLY4 as a potassium source increased yield on average by 4% up to a potential 22% yield improvement over MOP (FAOSTAT 2017)

**ii) Corn-** On average, an MOP + POLY4 blend generated a 7% yield improvement with a potential to increase yield by up to 14% in the United States, Brazil, Europe, Africa, China and Vietnam(FAO 2016)

**iii) Soybean-** The global agronomy programme shows that the average yield is increased up to 7% with MOP + POLY4 blend application (USDA 2017)

**iv) Potato-** In the United States, UK, Brazil, and India, testing on the potato were conducted on a global scale. To economically maximise yield and quality, POLY4 is a low-chloride K source that satisfies the crop's S and Mg needs. Data gathered from several sources revealed that POLY4 treatments increased yield over SOP applications by an average of 4%. (2018 Sardar Vallabhbhai University of Agriculture and Technology)

v) **Tomato-** Tomato is the most consumed vegetable worldwide. The largest producers were China, the United States and India. Trials showed that POLY4 treatments improved yield over MOP applications with an average yield gain of 18% (FAOSTAT 2017).

### **Future Strategies and Conclusion**

POLY4 is a naturally occurring, low-chloride and certified for organic use. It includes a variety of essential micronutrients as well as four of the six nutrients plants require to develop. With one straightforward product, it is an efficient fertilizer that enables farmers to maximise crop yield, raise crop quality, and enhance soil structure. Because POLY4 is made from a natural mineral and does not undergo any chemical processing, it differs from the majority of potash fertilizers. This backs up the organic registration of POLY4. SOP has a salt index of 97, MOP has 130, and POLY4 has a salt value of 76. POLY4 is a pH-neutral fertilizer that has no impact on the pH of the soil. By using POLY4 in fertilizer regimens, the acidifying impacts of other nutrient sources like ammonium sulphate may be lessened.

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