



POLY4
A SIRIUS MINERALS PRODUCT

TRIAL RESULTS

POTATOES

BRAZIL (2014)



poly4.com

TRIAL OBJECTIVE

Compare the efficiency of 4-14-08 blend made with MOP to a POLY4 option as source of K on potato yield and quality.

HIGHLIGHTS

YIELD RESPONSE TO MAGNESIUM DEMONSTRATED

6% IMPROVEMENT IN AVERAGE MARKETABLE YIELD

IMPROVEMENTS IN TUBER DRY MATTER

LOWER INPUT COSTS AND LESS INPUTS NEEDED

TRIAL DESIGN

PARTNER: UNIVERSITY OF SÃO PAULO
LOCATION: BRAZIL
YEAR: 2014

- In 2013, produced over 3.5 Mt of potatoes accounting for 23% of global production.¹
- South American potato market is worth US\$6 billion of which Brazil accounts for 22%.¹
- Approximately 70% of potatoes are for fresh market, 20% for processing and 10% for seed.²
- Soils are highly weathered and have naturally low fertility requiring high application of fertilizer.
- Official recommendation provides 40–80 kg N ha⁻¹, 100–300 kg P₂O₅ ha⁻¹, and 100 to 250 kg K₂O ha⁻¹, at planting followed by 40–80 N ha⁻¹ at hilling.³
- Brazil potato growers will often use 4-14-8 blends applied prior to planting.
- This rate response study evaluated a balanced MOP 4-14-8 blend against a POLY4 equivalent.^{4,5}

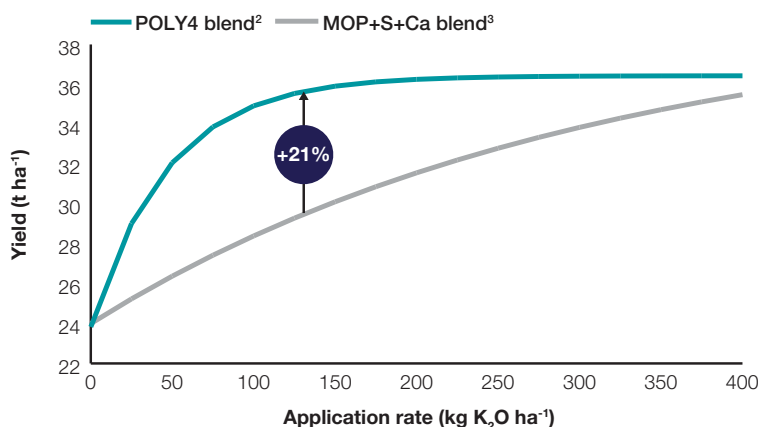
TREATMENT TABLE

TREATMENTS	AVERAGE NUTRIENT APPLIED (kg ha ⁻¹)						
	N	P ₂ O ₅	K ₂ O	CaO	MgO	S	Cl
MOP	177	615	352	934	0	380	281
POLY4	174	614	351	418	150	478	75



MARKETABLE YIELD⁶

- POLY4 blend achieves peak yield from 125 kg K₂O ha⁻¹ compared to the standard 400 kg K₂O required from the current commercial blend.
- Using POLY4 blends product application rate can be 68% less whilst maintaining yield.
- These yield improvements demonstrate practical considerations of POLY4 blends to growers without compromising yields.



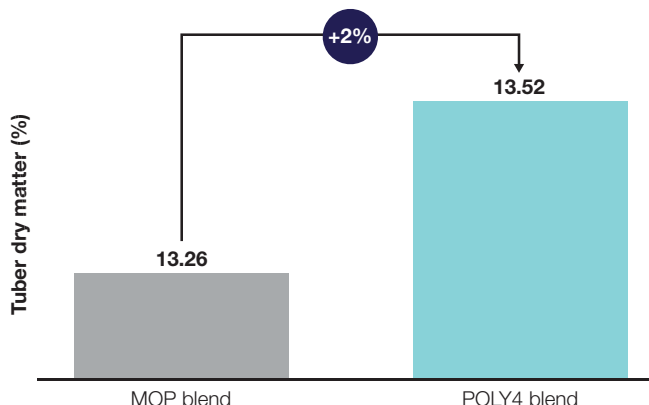
MARKETABLE YIELD BY SIZE^{4,5,7,8}

- In this balanced NPK, calcium and sulphur trial, the POLY4 (4:14:8) blend outperformed its commercial equivalent by 6%.
- POLY4 blend improved the yield of small potatoes by 9% compared to MOP blend.
- For the desirable potatoes of larger than 6cm, POLY4 blend improved yields by 4%.
- The additional nutrients from POLY4, particularly magnesium, in this blend supported larger yields.
- POLY4 successfully substitutes calcium and sulphur from TSP and expensive SSP.

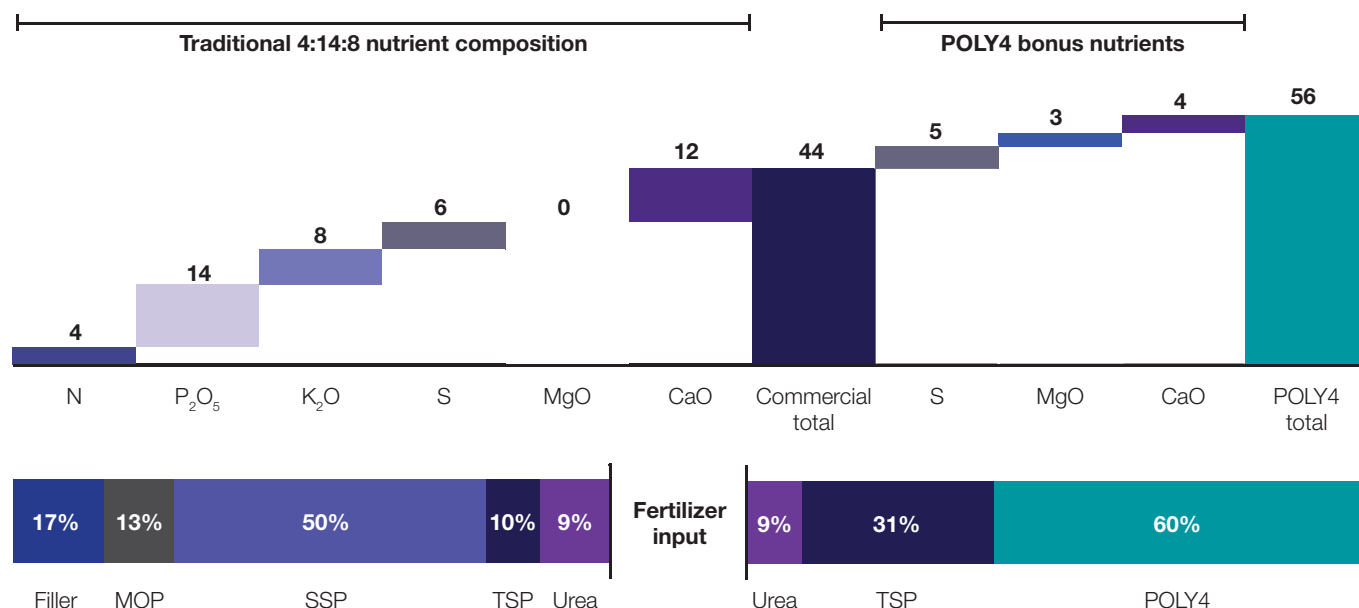


TUBER QUALITY^{4,5,7}

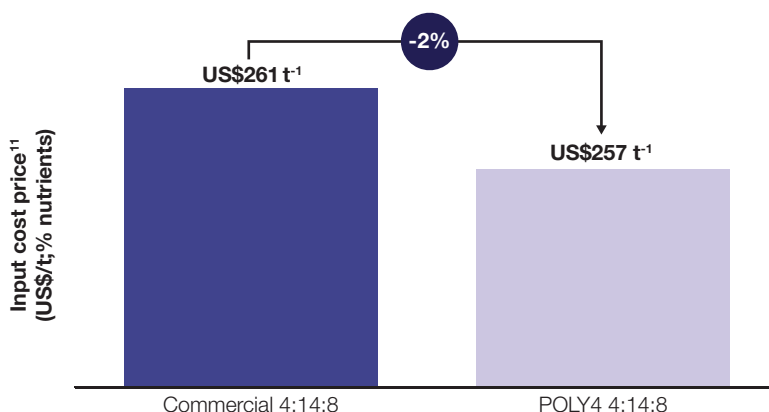
- Tuber dry matter is an indicator of total energy and nutrient content in the edible crop.
- POLY4 improved tuber dry matter by 2% over the MOP blend.
- Being essentially chloride free, POLY4 removes the problem of chloride management, commonly associated with MOP use.
- Chlorides can be responsible for up to 2% reduction in tuber dry matter content.^{9,10}



BRAZIL POLY4 NPK OPTION



- Inclusion of POLY4 improves the total nutrient content of the blend and could reduce input costs.¹¹
- The POLY4 option simplifies the blend feedstock reducing inputs.
- Supplementation of the commercial blend with magnesium would add an extra ~US\$30/t cost.
- POLY4 option provides beneficial micro-nutrients not supplied by the traditional 4:14:8 NPK blend.
- Trial results indicate that POLY4 blend fed potatoes require less product.



FAOSTAT 2017; 2) US Potato Board 2014; 3) IAC, 2014; 4) Made with MOP, Urea, TSP and SSP for 4:14:8; 5) Made with POLY4, Urea and MAP for 4:14:8; 6) GENSTAT regression analysis; 7) GENSTAT mean results; 8) Small = <6 cm length; Medium = 6–9 cm length; Large = >9cm length; 9) The Potash Development Association, 2008; 10) University of Nebraska, 2014; 11) Input prices based on CFR Brazil estimates on: Urea Granular US\$350/t; TSP US\$385/t; MOP US\$400/t; SSP US\$300/t; POLY4 US\$200/t; Kieserite US\$250/t. Initial soil analyses pH 4.8; P 108 mg kg⁻¹, K 128 mg kg⁻¹, S 12 mg kg⁻¹, Mg 72 mg kg⁻¹, Ca 640 mg kg⁻¹.

Sources: Sirius Minerals, University of São Paulo (2014) 4000-USP-4012-14

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