

TRIAL RESULTS

POTATO

SCOTLAND, UK (2016)



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TRIAL OBJECTIVE

To compare the performance
POLY4+MOP option to that of MOP
and MOP+Kieserite.

HIGHLIGHTS

**HIGHER NUTRIENT
ACCUMULATION**

**INCREASED LEAF N, P, K
AND Ca CONTENTS**

**POLY4 MAXIMISES POTATO
YIELDS COMPARED TO
CONVENTIONAL NUTRIENT
ALTERNATIVES**

**POLY4 IS A VIABLE NUTRIENT
SOURCE FOR THE FRY QUALITY
POTATO MARKET**

HIGHER ECONOMIC RETURNS

**HIGHER CROP YIELD:
FERTILIZER RATE RATIO**

**LOWER FERTILIZER PRICE:
POTATO PRICE RATIO**

HIGHER VALUE-COST RATIO

TRIAL DESIGN

PARTNER: SAC CONSULTING

LOCATION: SCOTLAND, UK

YEAR: 2016

CROP VARIETY: ESTIMA

- The UK produced the highest potato yield across the european union in 2015 and 2016.¹
- Potato variety, estima, is suited for fresh market with a smooth white skin, shallow eyes and light yellow flesh.
- Potash (potassium fertilizer) is a very important input for potatoes affecting yield, quality and profitability.²
- Potasium also contributes to tuber quality vital for marketability.²
- Potassium enhances water use efficiency of potatoes.²
- Potatoes are partial chloride sensitive high-value crops.
- Potatoes require Mg as part of the NPK fertilizer plan.

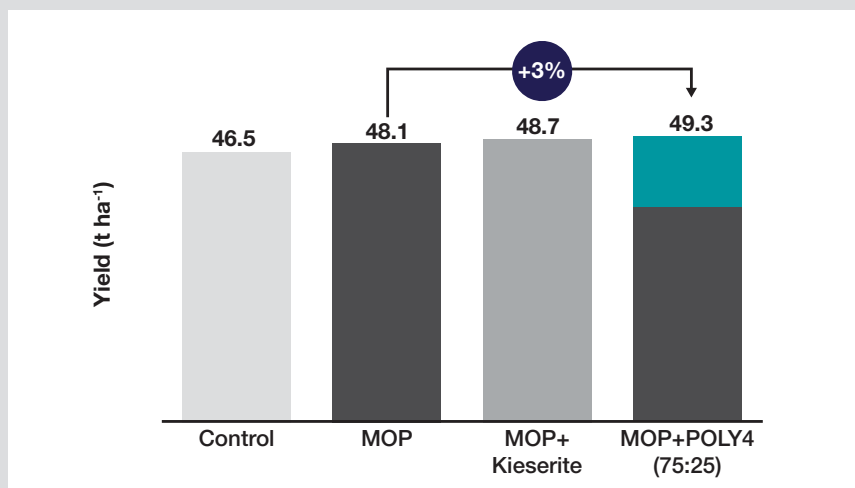


TREATMENT TABLE

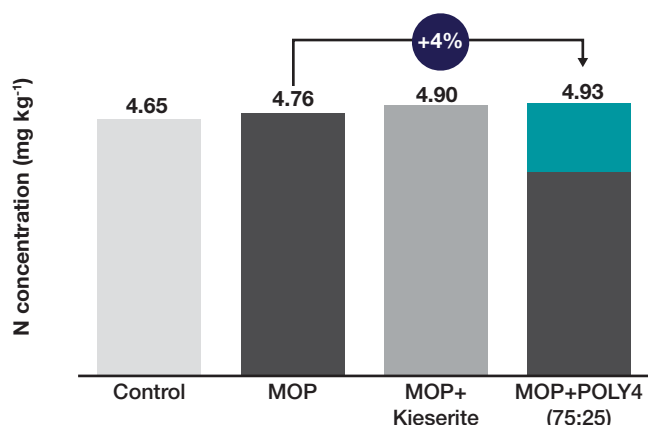
TREATMENTS	AMOUNT OF NUTRIENT APPLIED (kg ha ⁻¹) ³						
	N	P ₂ O ₅	K ₂ O	MgO	CaO	S	Cl
Control	200	150	200	0	0	0	0
MOP	200	150	200	0	0	0	160
MOP+ Kieserite	200	150	200	21	0	16	160
MOP + POLY4 (75:25)	200	150	200	21	60	68	131

TUBER YIELD^{3,4}

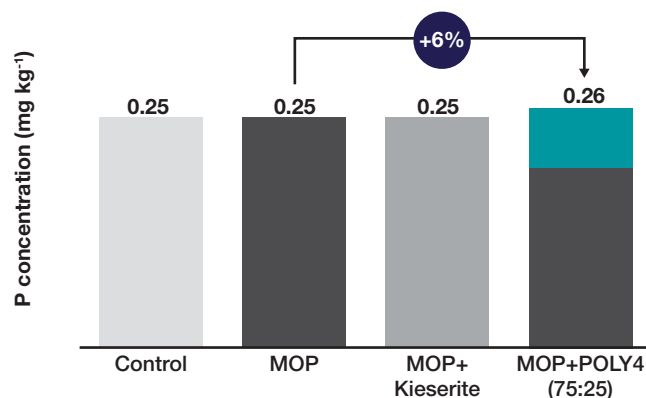
- Using POLY with MOP in a 75:25 K_2O ratio generated higher yields than the control, MOP, MOP+Kieserite treatments.
- Using POLY with MOP in a 75:25 K_2O ratio increased potato yield by 6% compared to the control treatment.
- MOP+POLY4 option increased potato yield by 2.5% and 1.2% than the MOP and MOP+Kieserite options respectively.



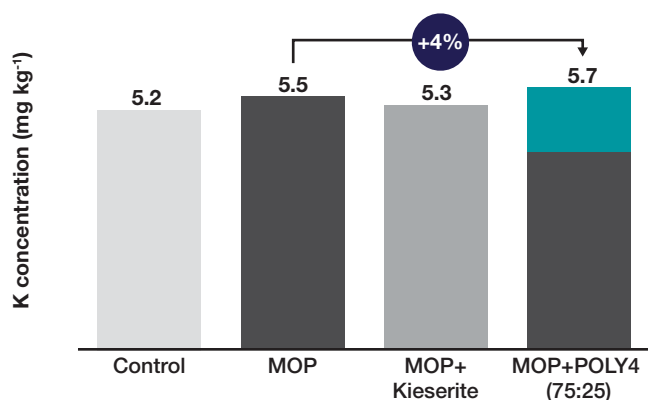
NUTRIENT CONCENTRATION^{3,4}



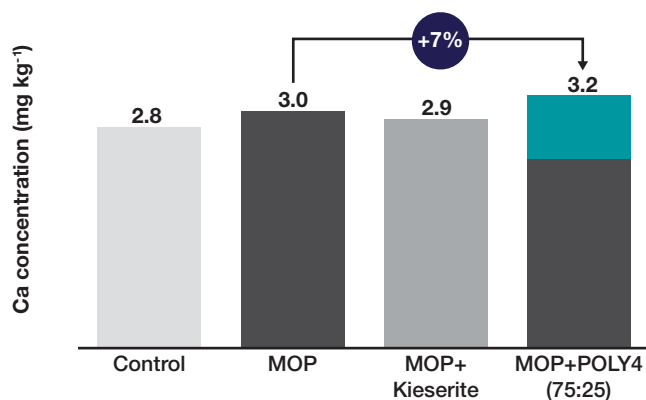
A: Leaf N content



B: Leaf P content



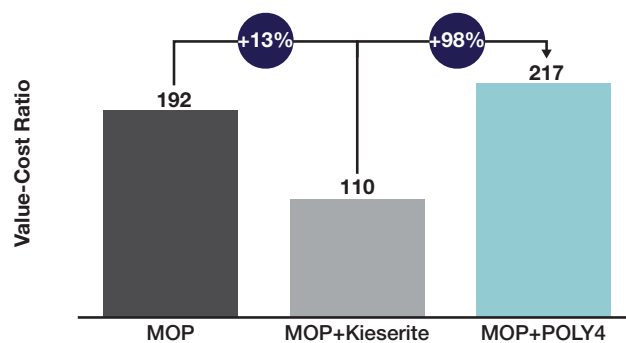
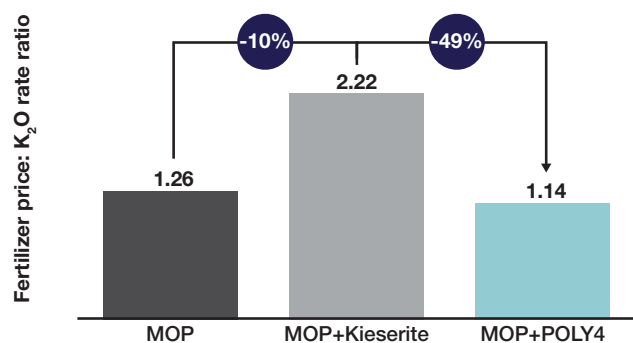
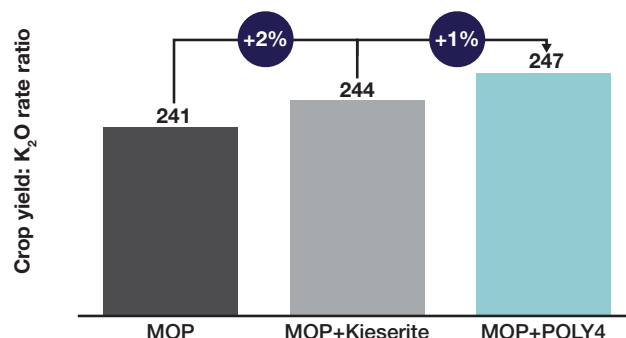
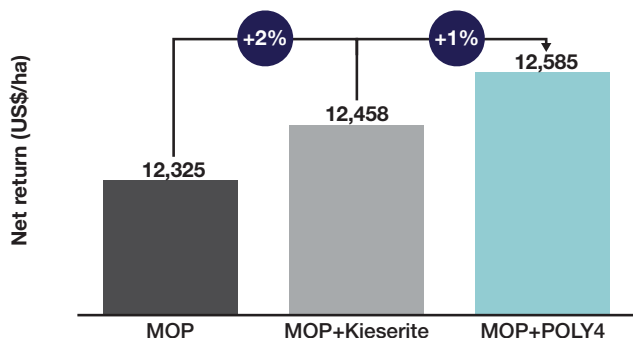
C: Leaf K content



D: Leaf Ca content

- Using POLY with MOP in a 75:25 K_2O ratio resulted in higher concentration of leaf N content by 4%, leaf phosphorus (P) content by 6%, leaf potassium (K) content by 4% and leaf calcium (Ca) content by 7% more than MOP treatment and by a similar margin over the MOP+Kieserite treatment.

ECONOMIC ANALYSIS^{4,5,6,7}



- Using POLY4 with MOP in a 75:25 K₂O ratio generated higher economic returns compared to MOP and MOP+Kieserite options.
- MOP+POLY4 option gives higher Yield:Fertilizer rate ratio than MOP and MOP+Kieserite, indicating that MOP+POLY4 option is associated with higher yield.
- MOP+POLY4 option gives lower Fertilizer Price:Crop Price ratio than MOP and MOP+Kieserite, indicating the cost effectiveness of the MOP+POLY4 option.
- Using POLY4 with MOP in a 75:25 K₂O ratio increased Value:Cost ratio by 13% and 98% over MOP and MOP+Kieserite options respectively.
- Value:Cost ratios indicate that to supply K, Mg and S to potatoes, MOP+POLY4 option adds more value than its cost compared to the MOP+Kieserite option.

Note: 1) Eurostat (2017); 2) Potash Development Association (2007); 3) All treatments received 200 kg N ha⁻¹ and 150 kg P₂O₅ ha⁻¹ from AN and TSP source; 3) MOP+POLY4 was used in a ratio of 75:25 to meet the K₂O requirement; 4) Results presented are based on data from GENSTAT analysis.; 5) Fertilizer prices: MOP price for North West Europe (US\$260/t), POLY4 (US\$200/t), Kieserite (US\$250/t). Analysis accounts for fertilizer application or spreading cost of US\$20.11/t for North West Europe, Potato price for the Estima variety was US\$259/t from AHDB (converted from £/t to US\$/t using exchange rate of 1.43677) for the week commencing 1 April 2016.; 6) Net Return = Crop output (US\$/ha) – (Cost of fertilizer material + Cost of fertilizer application), Value:Cost Ratio is the ratio of crop yield to fertilizer rate divided by ratio of fertilizer price to crop price.; 7) Economic analyses were based on K₂O rate of 200 kg ha⁻¹. Initial soil analysis pH 5.8, P 4.7 mg kg⁻¹, K 90 mg kg⁻¹, Mg 86 mg kg⁻¹, S 17 mg kg⁻¹

Sources: SAC (2016) 16000-SAC-16012-16

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