

TRIAL RESULTS

POTATO

STAFFORDSHIRE, UK (2015)



TRIAL OBJECTIVES

To investigate:

The effect of potassium and magnesium supplied at different ratios and from different sources.

Different K₂O application rates from MOP, SOP and POLY4.

HIGHLIGHTS

**UP TO 16% OVERALL
YIELD IMPROVEMENT**

**ECONOMIC ALTERNATIVE
FOR THE FARMER**

**TUBER DRY MATTER
MAINTAINED**

TRIAL DESIGN

PARTNER: INTERNATIONAL COMMERCIAL PARTNER

LOCATION: STAFFORDSHIRE, UK

YEAR: 2015

CROP VARIETY: PENTLAND DELL

CONDITIONS: RAIN FED

- Potato crops are among the most important energy sources for human nutrition in Europe.
- The UK produced over 5.2 million tonnes of potatoes in 2016.
- The trial, established with a commercial partner, was designed in two stages: the first was a comparison of potassium and magnesium sources, the second was a rate response study.



TREATMENT TABLE (kg ha⁻¹)^{1,2}

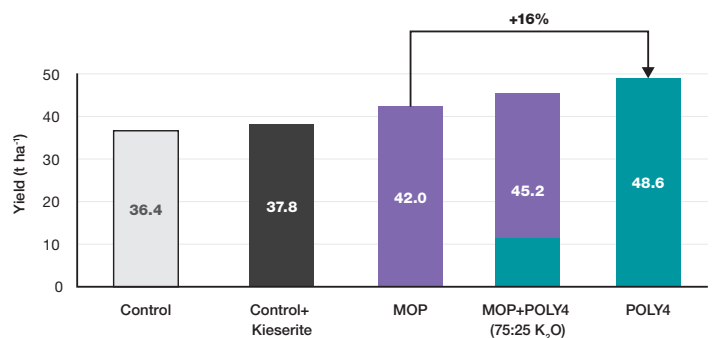
NUTRIENT	NUTRIENT APPLIED IN TRIAL (kg ha ⁻¹)						
	N	P ₂ O ₅	K ₂ O	MgO	CaO	S	Cl
Control	220	100	0	0	0	0	0
Control+ Kieserite	220	100	0	80	0	37	0
MOP	220	100	300	0	0	0	240
MOP+POLY4 (75:25 K ₂ O)	220	100	300	32	90	101	198
POLY4	220	100	300	128	364	407	64



RESULT VALUE OF K₂O AND MgO

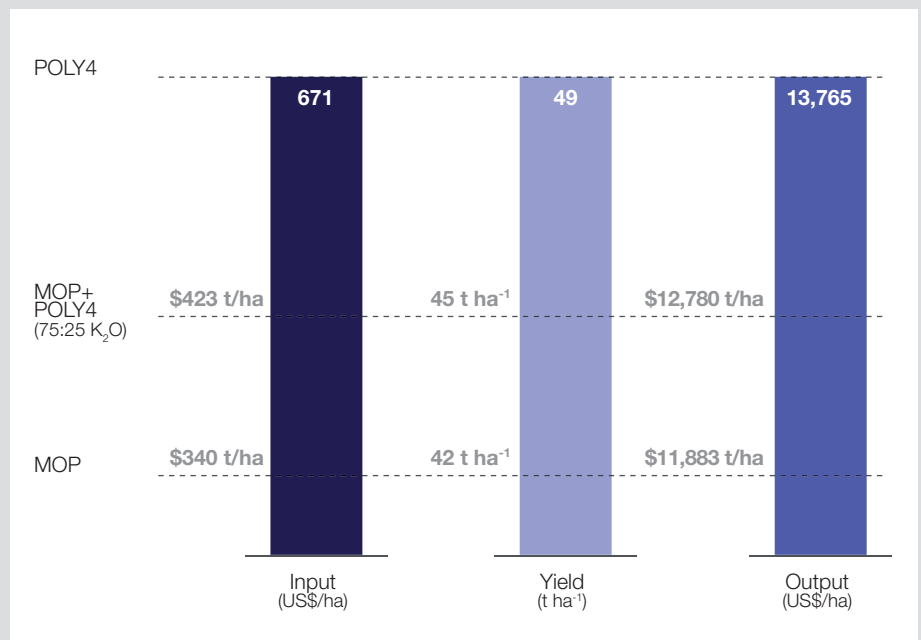
YIELD SUMMARY (t ha⁻¹)¹⁻³

- Yield improvement of 16% over MOP.
- Substituting POLY4 as a percentage of the potassium source was assessed at the recommended application rate of 300 kg K₂O ha⁻¹.
- Potassium-magnesium ion antagonism is a common problem for crops that demand high levels of potassium including potatoes.
- Substituting POLY4 for MOP on a potassium basis supports yield improvements by introducing MgO.
- POLY4's inclusion in the fertilizer plans provided yield improvements of 8–16% over the MOP option.



ECONOMIC SUMMARY¹⁻⁴

- Yield improvement of 16% – equivalent of \$1551 per hectare, when compared to MOP – offsetting the additional input cost of POLY4 (US\$331 improvement margin).
- MOP+POLY4 offers a flexible economic option with the most efficient input cost vs improved returns on crop yield at US\$814/ha, when compared to MOP.

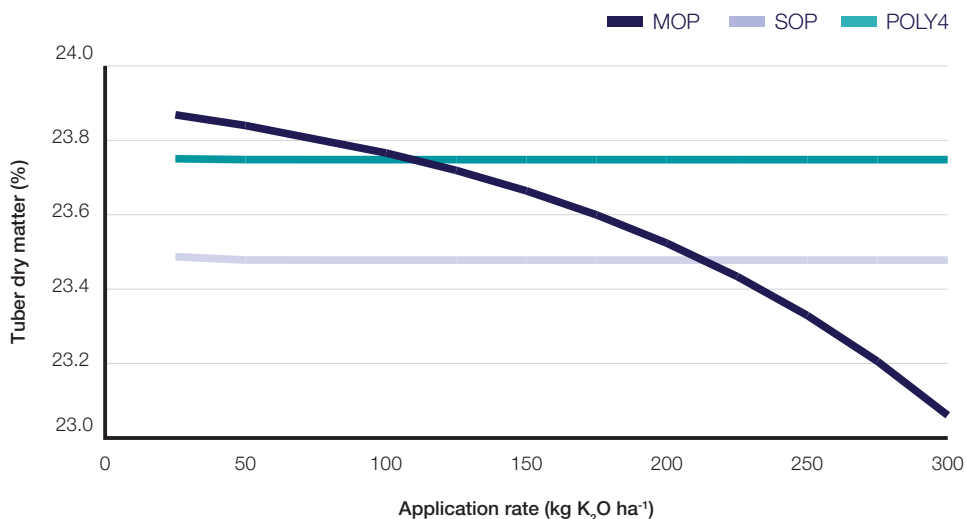


RESULT

RATE RESPONSE STUDY

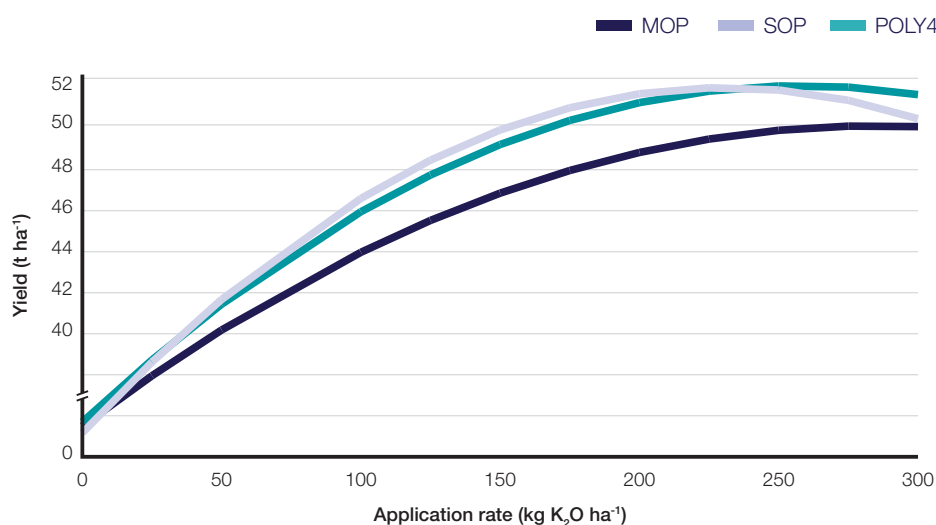
QUALITY SUMMARY ^{1,2,5,6}

- POLY4 maintains tuber dry matter at a higher level than SOP and MOP which is important to fry quality.
- Tuber dry matter content responded positively to the reduction in chloride and the additional nutrients supplied from POLY4.



YIELD SUMMARY ^{1,5,6}

- POLY4 improves yield through a range of application rates compared to MOP.
- The recommended rate of 300 kg K₂O ha⁻¹ is required for potatoes at this site to achieve optimal yields.



1) All plots received 220 kg N ha⁻¹ from AN, 100 kg P₂O₅ ha⁻¹ from DAP; 2) MOP and/or POLY4 supplied 300 kg K₂O ha⁻¹ except for in Control and Control+Kieserite plots; 3) GENSTAT means; 4) Fertilizer prices used are AN (US\$203/t), DAP (US\$353/t), POLY4 (US\$200/t), MOP (US\$200/t); 5) GENSTAT regression 6) Potassium fertilizers were applied at rates of 1.0–400 kg K₂O ha.

Source: Commercial Partner (2015) 22000-MAC-22010-15-SOW