**TRIAL OBJECTIVE**

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

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**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**

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**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
- Potassium 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.

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**TREATMENT TABLE**

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>AMOUNT OF NUTRIENT APPLIED (kg ha⁻¹)³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>N</strong></td>
</tr>
<tr>
<td>Control</td>
<td>200</td>
</tr>
<tr>
<td>MOP</td>
<td>200</td>
</tr>
<tr>
<td>MOP + Kieserite</td>
<td>200</td>
</tr>
<tr>
<td>MOP + POLY4 (75:25)</td>
<td>200</td>
</tr>
</tbody>
</table>
• Using POLY with MOP in a 75:25 K₂O ratio generated higher yields than the control, MOP, MOP+Kieserite treatments.

• Using POLY with MOP in a 75:25 K₂O 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.

• Using POLY with MOP in a 75:25 K₂O 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

- Using POLY4 with MOP in a 75:25 K\textsubscript{2}O 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.

Note: 1) Eurostat (2017); 2) Potash Development Association (2007); 3) All treatments received 200 kg N ha\textsuperscript{-1} and 150 kg P\textsubscript{2}O\textsubscript{5} ha\textsuperscript{-1} from AN and TSP source; 3) MOP+POLY4 was used in a ratio of 75:25 to meet the K\textsubscript{2}O 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 K\textsubscript{2}O rate of 200 kg ha\textsuperscript{-1}. Initial soil analysis pH 5.8, P 4.7 mg kg\textsuperscript{-1}, K 90 mg kg\textsuperscript{-1}, Mg 86 mg kg\textsuperscript{-1}, S 17 mg kg\textsuperscript{-1}.

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