TRIAL OBJECTIVES
To assess the effect of POLY4 as a K₂O source on wheat yield and yield attributes, and to assess the differences in rate response between two sources.

HIGHLIGHTS
9% INCREASE IN YIELD
10% INCREASE IN TOTAL BIOMASS YIELD
ENHANCED GRAIN AND STRAW UPTAKE OF N, K, S, Mg AND Ca
INCREASE IN FARMER RETURN OF US$24/ha
IMPROVEMENT IN WHEAT PROTEIN, A VALUABLE QUALITY TRAIT

TRIAL DESIGN
PARTNERS: NANJING INSTITUTE OF SOIL SCIENCE, CHINESE ACADEMY OF SCIENCE
LOCATION: NANJING, CHINA
YEAR: 2015

• Wheat is the third largest crop in mainland China based on hectares planted.¹
• Jiangsu province, where this trial was conducted, is one of the key wheat producing regions.
• In 2015, wheat accounted for 21% of Chinese grain production.²

TREATMENT TABLE (kg ha⁻¹)³

<table>
<thead>
<tr>
<th>NUTRIENT</th>
<th>AVERAGE NUTRIENT APPLIED IN TRIAL (kg ha⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Control</td>
<td>180</td>
</tr>
<tr>
<td>MOP</td>
<td>180</td>
</tr>
<tr>
<td>POLY4</td>
<td>180</td>
</tr>
</tbody>
</table>
• POLY4 increased wheat grain yield by 9%.

• MOP can replace potassium offtake but lacks sulphur to provide an additional yield boost.

• An increased yield from the same $K_2O$ application rate means an improved fertilizer use efficiency.

• In this straight trial, the increased availability of potassium, sulphur, magnesium and calcium to the plant from low chloride POLY4 is shown.

**YIELD RESULT** (t ha$^{-1}$)$^{3,4,8}$

- POLY4 increases plant biomass – an indicator of a taller and stronger wheat crop.

- POLY4 increased total biomass weight by 10% over MOP which can be attributed to a more balanced fertilizer plan.

**BIOMASS YIELD RESULT** (t ha$^{-1}$)$^{3,4}$

1. POLY4 increased wheat grain yield by 9%.

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3. An increased yield from the same $K_2O$ application rate means an improved fertilizer use efficiency.

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POLY4 is shown to support fertilizer use efficiency (FUE) by improving grain and biomass nutrient uptake.

Importantly, POLY4 ensures high FUE of nitrogen – a key element in support of the Chinese government’s zero growth policy.

POLY4 provides an excellent source of plant-available potassium, sulphur, magnesium and calcium.

The trial setup focused on demonstrating the effectiveness of POLY4 as a potassium source.

Accounting for an increase in the cost of the fertilizer plan in this straight trial, POLY4 still offers a more economical alternative with a margin over input increase of US$24 per hectare to the farmer.

Notes: 1) FAO 2014; 2) Based on data available in the Chinese Statistical yearbook; 3) All plots received 180 kg N ha⁻¹ and 120 kg P₂O₅ ha⁻¹ from Urea and DAP; 4) GENSTAT means; 5) Fertilizer prices based on China 2016 annual prices: urea (US$210/t), DAP (US$322/t), MOP (US$270/t), POLY4 (US$200/t); 6) Analysis accounts for yield changes and fertilizer application cost of US$10.78/t; 7) Wheat price fixed for 2016 at US$342/t; 8) Initial soil analysis pH 6.7, P 21.9 mg kg⁻¹, K 43.5 mg kg⁻¹, Ca 1096 mg kg⁻¹, Mg 214 mg kg⁻¹, S 119 mg kg⁻¹, EC 0.1 S m⁻².