Growing CORN IN TANZANIA

KEY FINDINGS
Grain yield increase of 12% compared to MOP and 95% to no-fertilizer application
5% cob size increase over MOP
Higher fertilizer margin

A CASE FOR POLY4

• Corn is a national priority for food security in Tanzania and has been placed in the “Big Results Now” intervention programme.

• Corn typically receives minimal fertilizer and no K or S.

• POLY4 offers K, S, Mg and Ca in a single product to meet a range of crop nutrient requirements.

poly4.com
**SIGNIFICANT GRAIN YIELD AND COB SIZE IMPROVEMENT**

The POLY4 blend treatments had significantly greater grain yield than other treatments. Cobs were significantly larger with the POLY4 blend compared to MOP. Data shows the average response to the K₂O rate of the best performing blend at each site.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Applied nutrients (kg ha⁻¹)</th>
<th>Grain yield (t ha⁻¹)</th>
<th>Cob size (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fertilizer</td>
<td>0 0 0 0 0 -</td>
<td>3.3</td>
<td>5.0</td>
</tr>
<tr>
<td>N + P (control)</td>
<td>120 60 0 0 0 -</td>
<td>5.7</td>
<td>6.3</td>
</tr>
<tr>
<td>POLY4 blend (15:20:5)</td>
<td>120 60 15 18 6.4 20 -</td>
<td>9.1</td>
<td>142</td>
</tr>
<tr>
<td>POLY4 blend (15:20:10)</td>
<td>120 60 30 16 5.7 18 -</td>
<td>9.1</td>
<td>201</td>
</tr>
<tr>
<td>POLY4 blend (15:20:15)</td>
<td>120 60 45 11 3.9 12 -</td>
<td>14.61</td>
<td>208</td>
</tr>
<tr>
<td>MOP blend (22:30:7)</td>
<td>120 60 15 0 0 0 -</td>
<td>1.642</td>
<td>219</td>
</tr>
<tr>
<td>MOP blend (20:26:13)</td>
<td>120 60 30 0 0 0 -</td>
<td>1.642</td>
<td>219</td>
</tr>
<tr>
<td>MOP blend (18:24:17)</td>
<td>120 60 45 0 0 0 -</td>
<td>1.642</td>
<td>219</td>
</tr>
</tbody>
</table>

- **INCREASED FERTILIZER MARGIN**
  
  Fertilizer margin is the value of the crop minus the cost of fertilizer and spreading. The POLY4 blend gave the greatest fertilizer margin.

- **ENHANCED COB GROWTH AND DISEASE RESILIENCE**
  
  POLY4 fertilized crops had more cobs per m² and fewer cobless plants. The POLY4 plan also reduced cob rot incidences by 25% compared to MOP.

---

**Trials were conducted at ten local farms across Tanzania. Six of the sites were responsive to K and/or S fertilizer (only these data are presented). 2) Pre-trial soil analysis: Karatu pH 6.2, 15 mg P kg⁻¹, 1014 mg K kg⁻¹, 2 mg S kg⁻¹, 3940 mg Ca kg⁻¹, 816 mg Mg kg⁻¹; Lushoto pH 6.3; 7 mg P kg⁻¹, 20 mg K kg⁻¹, 14 mg S kg⁻¹, 2520 mg Ca kg⁻¹, 576 mg Mg kg⁻¹; Uyole pH 6.1; 7 mg P kg⁻¹, 1443 mg K kg⁻¹, 15 mg S kg⁻¹, 1020 mg Ca kg⁻¹, 2520 mg Ca kg⁻¹, 576 mg Mg kg⁻¹; Mbozi pH 5.5; 7 mg P kg⁻¹, 741 mg K kg⁻¹, 14 mg S kg⁻¹, 580 mg Ca kg⁻¹, 204 mg Mg kg⁻¹; Babati pH 6.4; 17 mg P kg⁻¹, 234 mg K kg⁻¹, 26 mg S kg⁻¹, 5580 mg Ca kg⁻¹, 516 mg Mg kg⁻¹; Inyala pH 6.3; 4 mg P kg⁻¹, 230 mg K kg⁻¹, 4 mg S kg⁻¹, 5160 mg Ca kg⁻¹, 240 mg Mg kg⁻¹; 3) N and P were applied at 120 kg N ha⁻¹ and 60 kg P₂O₅ ha⁻¹ to all treatments except to the no-fertilizer (control). N includes 45 kg ha⁻¹ in blend from DAP and urea, and 75 kg ha⁻¹ top dressed as urea; potassium in POLY4 blend from POLY4 and MOP; 4) Genstat analysis of variance blocked by site. Mean separation by Fishers LSD at the 5% significance level; values are means at the economically optimal potassium rate for each site: Karatu (30 kg K₂O ha⁻¹), Lushoto (average of rates), Uyole (30 kg K₂O ha⁻¹), Mbozi (15 kg K₂O ha⁻¹), Babati (45 kg K₂O ha⁻¹), Inyala (45 kg K₂O ha⁻¹); 5) Cob rot incidence sites: Karatu (30 kg K₂O), Lushoto (average of rates), Uyole, Babati (45 kg K₂O ha⁻¹), Inyala (45 kg K₂O ha⁻¹); 6) Fertilizer margin is based on the crop return minus fertilizer costs. Fertilizer costs were FOB, urea: US$290/t, DAP: US$441/t, MOP: US$337/t, POLY4: US$200/t. Crop price was US$282/t.

**Sources:** Selian Agricultural Research Institute (2017-2018) 25000-SOH-25011-16, 25000-SOH-25012-17

*Sirius Minerals recommends that growers utilise local good phytosanitary practices in disease management.*

---

**TRIAL FOCUS**

The POLY4 blend treatments were compared to commercial MOP blends.

---

**PARTNER**

Selian Agricultural Research Institute

**LOCATION**

Southern and Northern Highlands, Tanzania

**DATE**

2017-2018