

Growing CORN IN TANZANIA



POLY4
A SIRIUS MINERALS PRODUCT

K ₂ O	S	MgO	CaO
14%	19%	6%	17%

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



POLY4 BENEFITS



Source of macro and micro nutrients



Extended nutrient delivery profile



Improved fertilizer use efficiency



pH neutral

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.

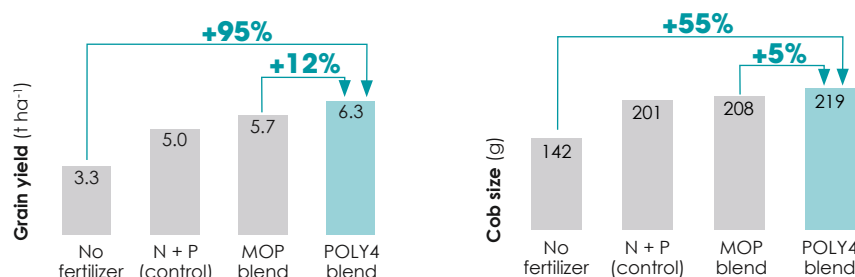
Treatment	Applied nutrients (kg ha ⁻¹)						
	N	P ₂ O ₅	K ₂ O	CaO	MgO	S	% K from POLY4
No fertilizer	0	0	0	0	0	0	-
N + P (control)	120	60	0	0	0	0	-
POLY4 blend (15:20:5)	120	60	15	18	6.4	20	100
POLY4 blend (15:20:10)	120	60	30	16	5.7	18	45
POLY4 blend (15:20:15)	120	60	45	11	3.9	12	20
MOP blend (22:30:7)	120	60	15	0	0	0	-
MOP blend (20:26:13)	120	60	30	0	0	0	-
MOP blend (18:24:17)	120	60	45	0	0	0	-



SIGNIFICANT GRAIN YIELD AND COB SIZE IMPROVEMENT



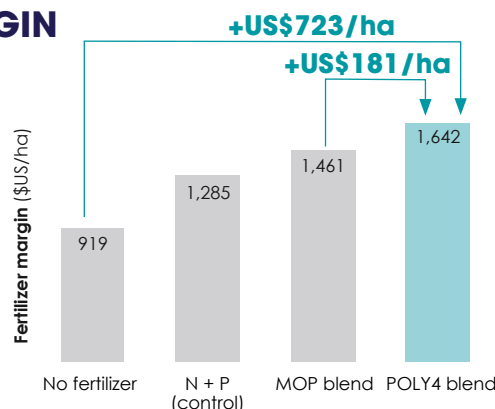
The POLY4 blend treatments had significantly greater grain yield than other treatments. Cobs were significantly larger with the POLY4 blend compared to MOP. Data shows the average response to the K₂O rate of the best performing blend at each site.



INCREASED FERTILIZER MARGIN



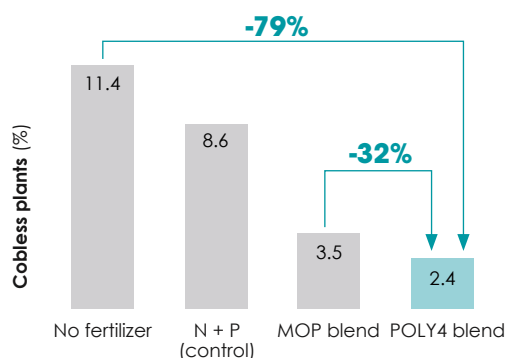
Fertilizer margin is the value of the crop minus the cost of fertilizer and spreading. The POLY4 blend gave the greatest fertilizer margin.



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.



TRIAL FOCUS

Corn response to POLY4 blends was compared to commercial MOP blends.

PARTNER

Selian Agricultural Research Institute

LOCATION

Southern and Northern Highlands, Tanzania

DATE

2017-2018

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; 6 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; 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, (30 kg K₂O), Babati (45 kg K₂O), Inyala (45 kg K₂O); 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.

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