

TRIAL RESULTS

# TOBACCO

**TABORA, TANZANIA (2016)**

## HIGHLIGHTS

- POLY4 increased yield by 9%.
- Higher economic return by US\$162/ha.
- Improved tobacco quality.



# OVERVIEW

- 60% of tobacco in Tanzania is produced by small holders in the western region of the country.<sup>1</sup>
- Tobacco is sensitive to chloride and farmers in this region use a blend containing MOP and SOP to lower  $\text{Cl}^-$  input.

## TRIAL OBJECTIVE

**To assess a standard commercial tobacco blend against a POLY4-based alternative.**

**PARTNER:** TOBACCO RESEARCH INSTITUTE OF TANZANIA

**LOCATION:** TABORA, TANZANIA

**YEAR:** 2016

## METHODOLOGY

- This trial was conducted on a loamy sand soil.
- The inclusion of POLY4 in a 10:18:24 blend was compared with the typical local 10:18:24 blend and a synthetic POLY4-analogue blend balanced for S, Mg and Ca with gypsum and kieserite.
- Three  $\text{K}_2\text{O}$  application rates (80, 120 and 150  $\text{kg K}_2\text{O kg}^{-1}$ ) were used to compare performance of 10:18:24 blends.
- The average results are presented.

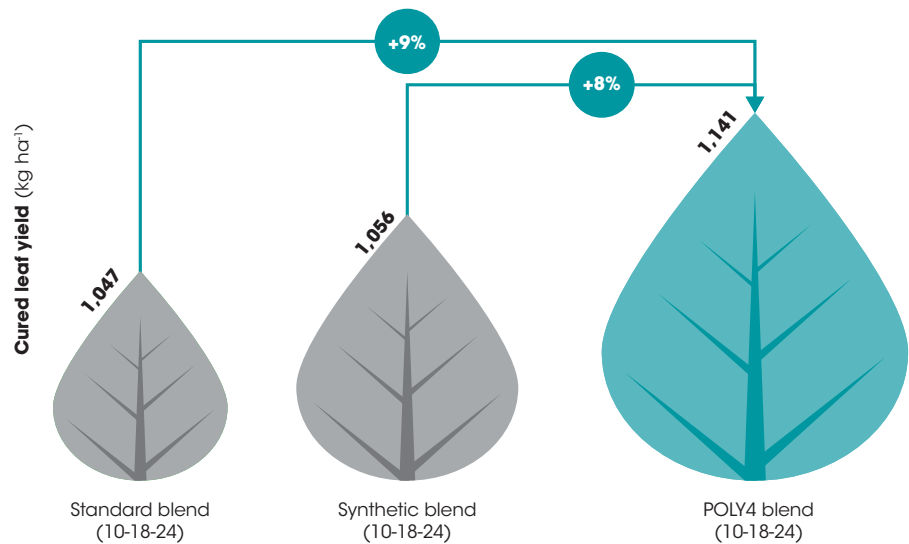
## TREATMENT TABLE<sup>2,3</sup>

Treatment	Average nutrients applied in trial ( $\text{kg ha}^{-1}$ )						
	N	$\text{P}_2\text{O}_5$	$\text{K}_2\text{O}$	CaO	MgO	S	Cl
Standard 10:18:24	83	87	117	0	0	31	31
Synthetic 10:18:24	83	87	117	11	4	40	31
POLY4 10:18:24	83	87	117	11	4	39	32

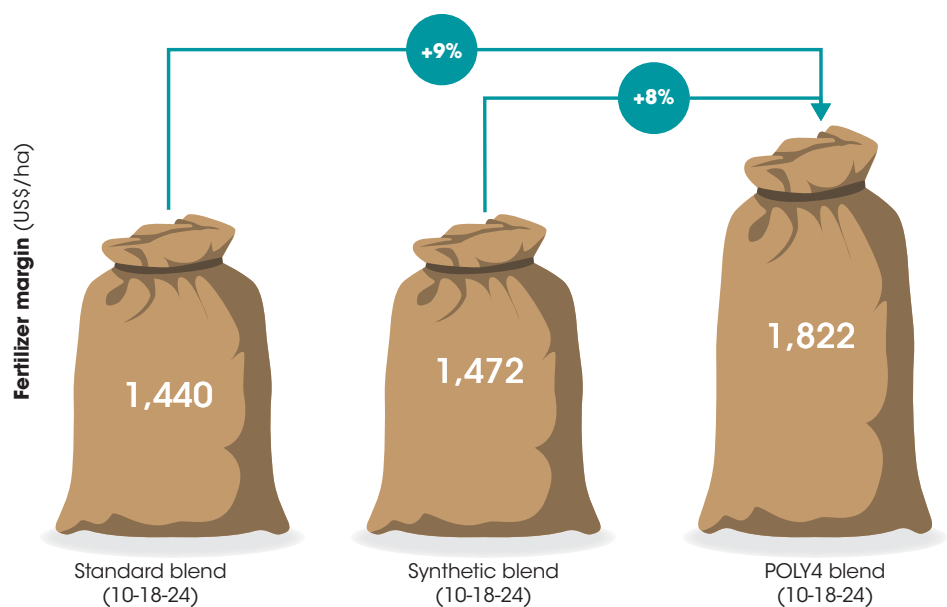


## INCREASE IN MARKETABLE LEAF YIELD<sup>4-7</sup>

- The POLY4 blend had greater marketable cured leaf yield than the standard and synthetic blends.
- The POLY4 blend applied more S, Ca and Mg than the standard blend and a similar amount to the synthetic blend.



## HIGHER ECONOMIC RETURN<sup>4-11</sup>



# GREATER FINANCIAL EFFICIENCY<sup>4-11</sup>

- The marginal benefit-cost ratio reflects the benefit obtained by changing the fertilizer plan compared to the cost incurred from doing so.
- For every extra dollar spent on the POLY4 blend above the standard blend, the fertilizer margin was improved by US\$49/ha while every extra dollar spent on the synthetic blend improved the margin by US\$3/ha.
- These ratios showed that the POLY4 blend offered greater financial efficiency and value for money.

Fertilizer option	Standard blend (10:18:24)	POLY4 blend (10:18:24)	Difference (POLY4 v standard)	Difference (%)
Yield (kg ha <sup>-1</sup> )	1047	1141	94	8.9
Crop price (US\$/t)	1770	1770	-	-
Output (US\$/ha)	1854	2019	165	8.9
Fertilizer cost (US\$/ha)	194	197	3.3	1.7
Fertilizer margin (US\$/ha)	1660	1822	162	9.8
Marginal benefit-cost ratio			49	

# IMPROVED TOBACCO QUALITY<sup>4-7</sup>

- Greater potassium (K) concentration in tobacco leaves improves the burning quality and this is reflected in improved grade and price.
- The POLY4 treatment had the greatest leaf K concentration with 20% higher than the standard blend.

Fertilizer option	Cured leaf K (%)	Cured leaf nicotine (%)	Cured leaf reducing sugars (%)
Standard 10:18:24	4.45	2.27	7.65
Synthetic 10:18:24	4.77	2.21	7.36
POLY4 10:18:24	5.35	2.27	7.53

Notes: 1) Trial report from TORITA (2016); 2) Initial soil analysis: pH 5.6, 20 mg P kg<sup>-1</sup>, 11 mg K kg<sup>-1</sup>, 1260 mg Ca kg<sup>-1</sup>, 38 mg Mg kg<sup>-1</sup>, 2 mg S kg<sup>-1</sup>; 3) All treatments received additional 33 kg N ha<sup>-1</sup> as top dressed urea; 4) Results presented are from GENSTAT ANOVA averaged across K<sub>2</sub>O fertilizer rates; 5) The standard 10:18:24 blend contains: 6.5% urea, 39% diammonium phosphate (DAP), 35% sulphate of potash (SOP), 11% muriate of potash (MOP); 6) The synthetic 10:18:24 blend contains: 6.5% urea, 39% DAP, 34% SOP, 11% MOP, 6.5% gypsum and 3% kieserite; 7) The POLY4 10:18:24 blend contains: 6.5% urea, 39% DAP, 13% POLY4, 31% SOP and 11% MOP; 8) Fertilizer prices based on annual prices for North Africa: POLY4 (US\$200/t), urea (US\$217/t), MOP (US\$246/t), SOP (US\$481/t), DAP (US\$360/t), gypsum (US\$25/t), kieserite (US\$250/t), spreading cost (US\$14.75/t); 9) Fertilizer margin = crop output – (cost of fertilizer material + cost of fertilizer application); 10) The economic assessments were based on marketable tobacco yield at tobacco price of US\$1770/t; 11) Marginal benefit-cost ratio = (output from fertilizer – output from standard blend) ÷ (cost of fertilizer – cost of standard blend).