

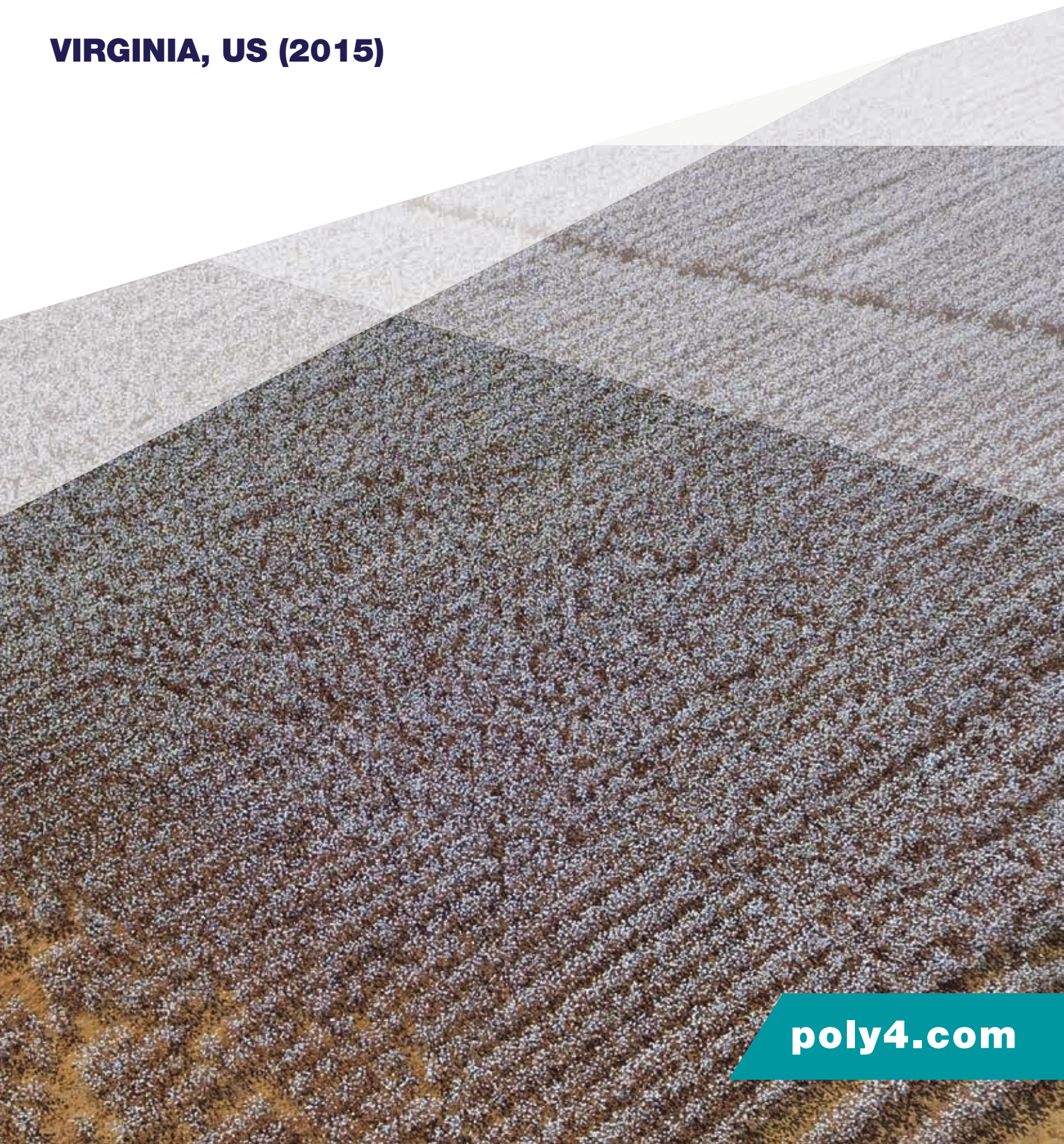


POLY4
A SIRIUS MINERALS PRODUCT

TRIAL RESULTS

COTTON

VIRGINIA, US (2015)



poly4.com

TRIAL OBJECTIVES

To evaluate cotton's response to potassium and sulphur from POLY4 compared to a synthetic alternative of MOP, Gypsum and Kieserite.

HIGHLIGHTS

US\$40 INCREASE IN RETURN PER HECTARE

LINT YIELD INCREASED BY 3%

16% INCREASE IN SULPHUR UPTAKE

QUALITY INDICATORS MAINTAINED INCLUDING FIBRE LENGTH, STRENGTH AND UNIFORMITY

TRIAL DESIGN

PARTNER: VIRGINIA TECH

LOCATION: VIRGINIA, US

YEAR: 2015

- Potassium demand rises when the rounded seed capsules (bolls) are set on the plant, forming a K sink to retain sufficient water pressure for fibre elongation. Supply is therefore critical for cotton.
- Calcium plays a vital role in the development of lint.
- Virginia cotton production is grown on coastal plains which are often deficient in both potassium and sulphur.
- This trial was conducted in the south-eastern coastal plain of Virginia within a medium to high fertile soil with a sand to sandy loam texture.
- This response study with 34, 67, 101 and 134 kg K₂O per hectare was applied by hand prior to planting.
- Four row plots were established with an area of 45 m², with four replications per treatment in a randomised complete block design.



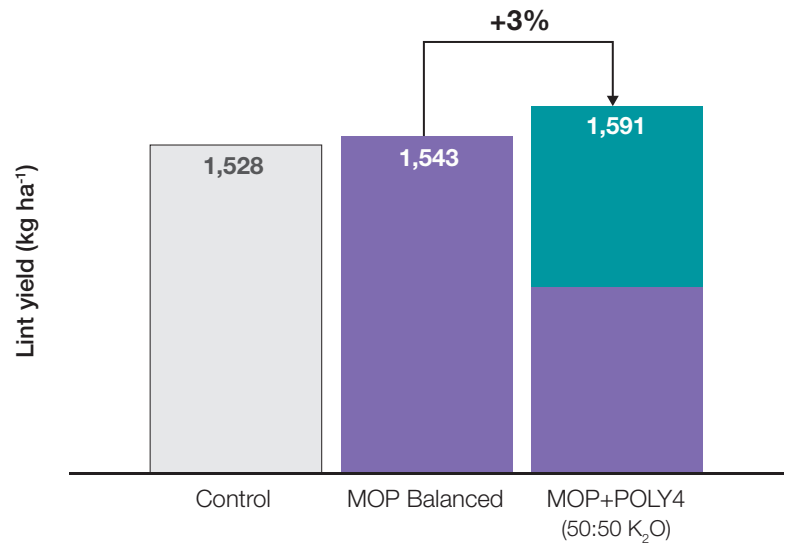
TREATMENT TABLE (kg ha⁻¹)

NUTRIENT	NUTRIENT APPLIED IN TRIAL (kg ha ⁻¹)						
	N	P ₂ O ₅	K ₂ O	MgO	CaO	S	Cl
Control	112	45	0	0	0	0	0
MOP Balanced	112	45	84	18	50	55	67
MOP+POLY4 (50:50 K ₂ O)	112	45	84	18	50	55	43



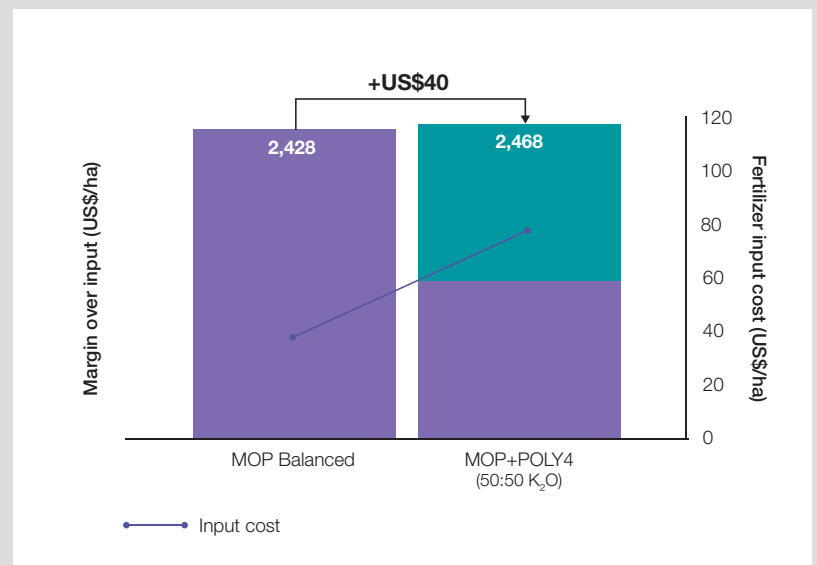
YIELD RESULTS (kg ha⁻¹)¹⁻⁴

- Cotton lint describes the fibres harvested and collected into bales for use in textile manufacturing.
- MOP+POLY4 showed a 3% improvement over the MOP Balanced alternative.



ECONOMIC SUMMARY (US\$/ha)⁵

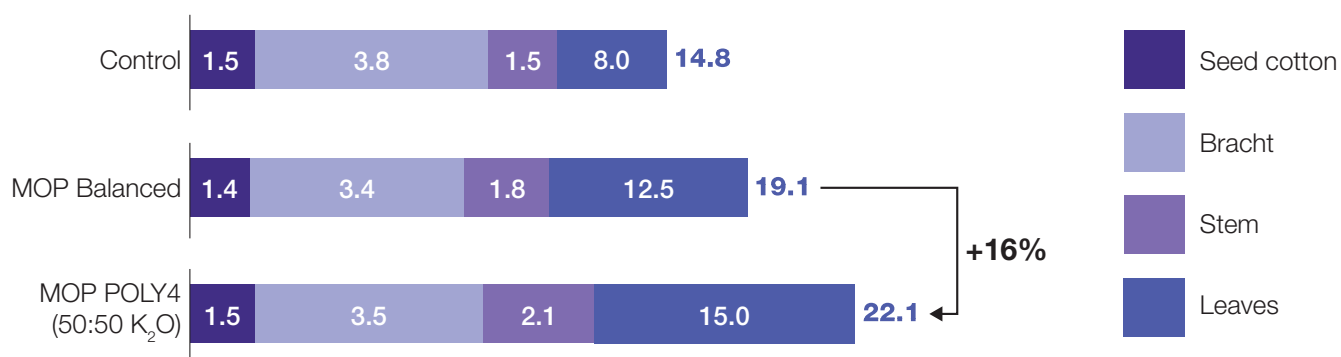
- Changing fertilizer inputs can increase a farmer's margin. Calculating economic returns using different multi nutrient fertilizer plans highlights the optimal solution for cotton growers.
- POLY4 contributes to an effective multi nutrient fertilizer plan in supporting farmer margins.
- For this cotton trial, the inclusion of POLY4 into a blend delivered an increase in a farmer's margin over input of US\$40 per hectare.^{3,4,5}



NUTRIENT UPTAKE (kg ha⁻¹)

- Increasing sulphur uptake through the cotton plant and into the cotton is essential for yield improvements.
- The MOP+POLY4 fertilizer plan showed a 16% improvement in sulphur uptake in the entire cotton plant compared to the MOP Balanced blend.
- POLY4 can be incorporated into a fertilizer plan to supply the crop sulphur need and support the potassium, magnesium and calcium requirement, more effectively than conventional options.
- The MOP+POLY4 blend produced 46 kg per hectare higher seed cotton yield than the control blend and 18 kg more per hectare than the MOP Balanced blend.

Sulphur uptake (kg ha⁻¹)



Notes: 1) GENSTAT means; 2) All treatments received 112 kg N ha⁻¹ and 45 kg P₂O₅ ha⁻¹ from AN and phosphorus solution source; 3) MOP+POLY4 was used in a ratio of 50:50 to meet the K₂O requirement; 4) MOP balanced was made from MOP, Gypsum and Kieserite.5) Fertilizer prices based on US East Coast 2016 Annual prices of MOP (US\$233/t), POLY4 (US\$200/t), Gypsum (US\$25/t) Kieserite (US\$250/t). Initial soil analysis P 35 mg kg⁻¹, K 73 mg kg⁻¹, Ca 211 mg kg⁻¹, Mg 33 mg kg⁻¹.

Source: Virginia Tech (2015) 23000-VIR-23010-15.