

TRIAL RESULTS

SOYBEAN

TEXAS, US (2014)



TRIAL OBJECTIVE

To compare soybean growth, yield and quality responses to MOP, SOP and POLY4.

HIGHLIGHTS

UP TO 18% YIELD IMPROVEMENT

TOTAL NUTRIENT UPTAKE IMPROVED BY 18–23% FOR MACRO-NUTRIENTS

16% HIGHER BEAN PROTEIN YIELD

TRIAL DESIGN

PARTNER: TEXAS A&M

LOCATION: US

YEAR: 2014

- The global soybean market is worth US\$119 billion with US producing 32% and Brazil 30% in 2012¹.
- The equivalent K₂O consumption of POLY4 would be 72 Mt in US and 38.2 Mt in Brazil².
- 85% of soybean is used in meal or oil production, 6% consumed and 9% in manufacturing³.
- Plots were set out in a randomised complete block design with four replications.
- Soybean variety used was Vernal 36.
- Soils were predominately calcareous with a sandy clay loam texture.

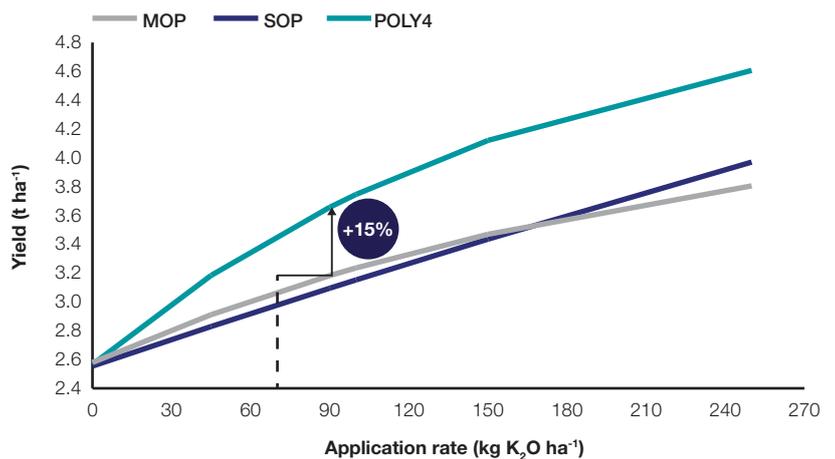
TREATMENT TABLE

TREATMENTS	NUTRIENTS APPLIED AT RECOMMENDED RATE (kg ha ⁻¹)					
	Fertilizer	K ₂ O	CaO	MgO	S	Cl
MOP	90	0	0	0	0	72
SOP	90	0	0	0	13	5
POLY4	90	109	38	122	19	



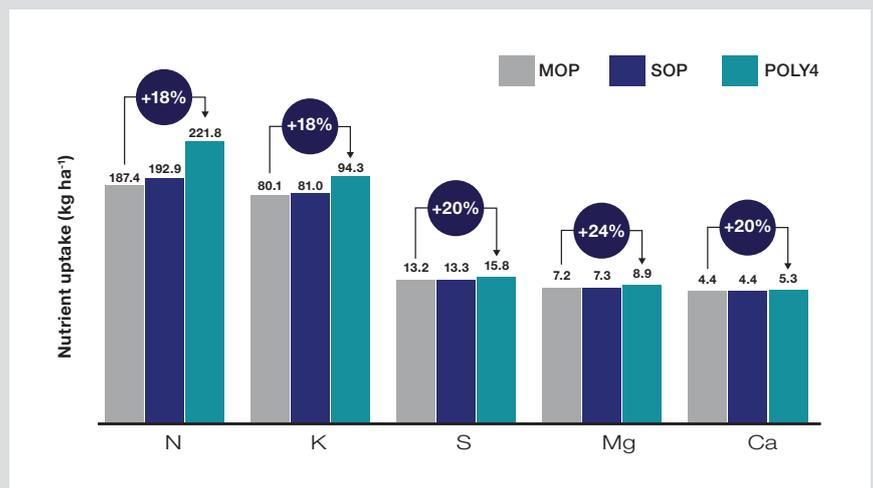
SOYBEAN YIELD (t ha⁻¹)⁴⁻⁶

- POLY4 improved yields over MOP by 15% and SOP by 18% at the recommended application⁶ at 90 kg K₂O ha⁻¹.
- Improved yield with POLY4 indicates the value of the addition of magnesium and calcium.
- To maintain a yield of 3.2 t ha⁻¹, POLY4 can be used at 75 kg K₂O ha⁻¹ replacing offtake then supplying an additional 32 kg MgO, 67 kg CaO and 101 kg S ha⁻¹.
- Balanced nutrition is more effective thus an option presents itself to reduce inputs.



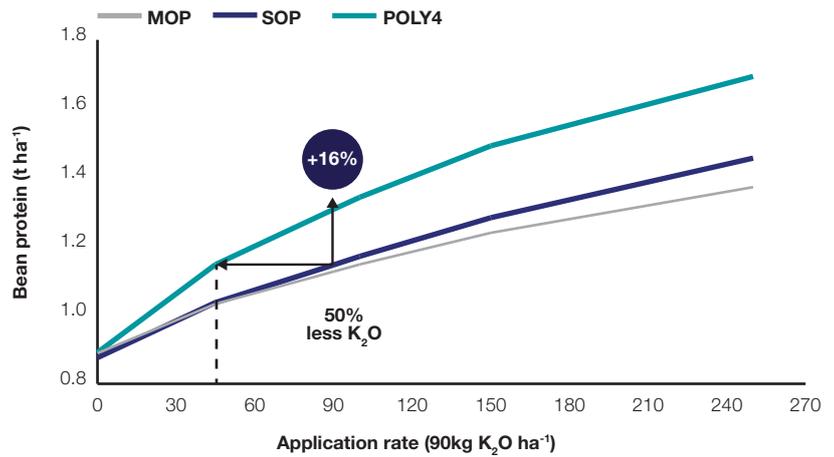
SOYBEAN TOTAL NUTRIENT UPTAKE (kg ha⁻¹)^{5,7}

- POLY4 drives significant improvements in nutrient uptake for N, K, S, Mg and Ca even on a high nutrient testing soil.
- Results indicate POLY4 supports improved fertilizer use efficiency.
- Improving the nutrient uptake means yields contain more nutrients essential for soybean meals.



BEAN PROTEIN YIELD (t ha⁻¹)^{4,5}

- Commercial success of the soybean crop reflects yield and protein content in the harvested bean.
- POLY4, a vital component of a multi-nutrient fertilizer plan, supports a significant improvement over MOP at the recommended application rate of 90 kg K₂O ha⁻¹ ⁽⁶⁾.
- Using 50% less K₂O with POLY4 still maintains bean protein of 1.1 t ha⁻¹ compared to MOP at the recommended application rate of 90 kg K₂O ha⁻¹ ⁽⁷⁾.



Notes: 1) FAO 2017; 2) Based on the recommended rate of 90 kg K₂O ha⁻¹; 3) SoyaTech 2015; 4) GENSTAT regression analysis; 5) 35 kg N ha⁻¹ and 45 kg P₂O₅ ha⁻¹ was added to all treatments; 6) 23 kg K₂O t⁻¹ grain recommendation adapted from "The Fertilizer Handbook" TFI, 1982 with a 3.6 t ha⁻¹ yield; 7) GENSTAT means results over 50–250 kg K₂O ha⁻¹. Initial soil analysis pH 7.4; P 19 mg kg⁻¹, K 242 mg kg⁻¹, S 177 mg kg⁻¹, Mg 213 mg kg⁻¹, Ca 1029 mg kg⁻¹

Sources: Texas A&M (2014) 0000-TAM-0027-14

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