

TRIAL RESULTS

SOYBEAN

TEXAS, US (2014)



poly4.com

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.

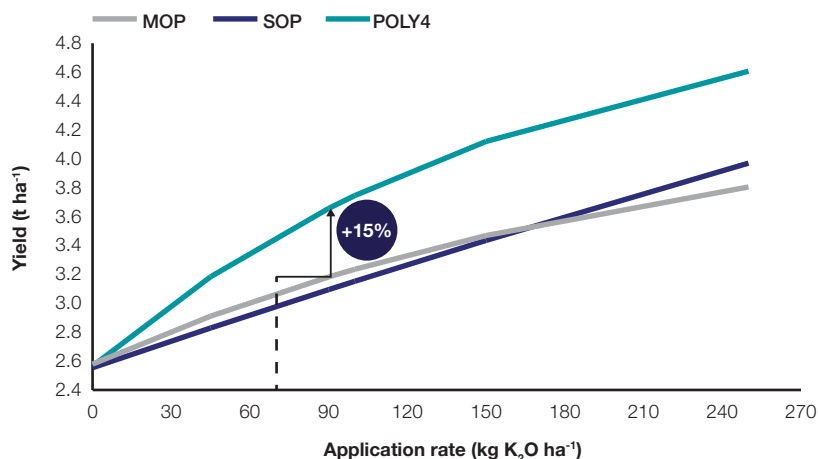
TREATMENT TABLE

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



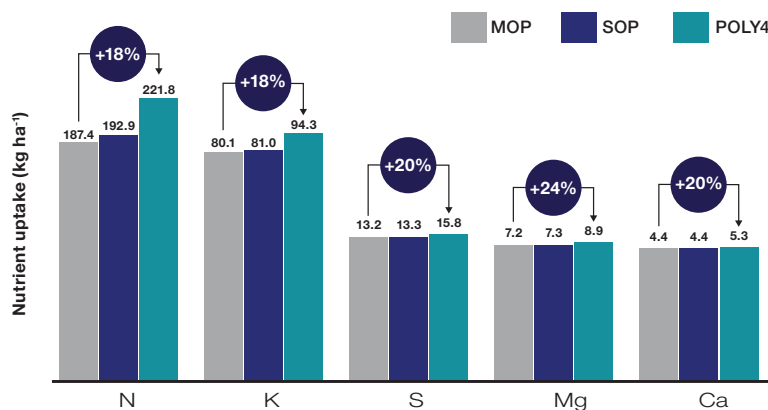
SOYBEAN YIELD $(t\ ha^{-1})^{4-6}$

- POLY4 improved yields over MOP by 15% and SOP by 18% at the recommended application⁶ at $90\ kg\ K_2O\ ha^{-1}$.
- 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 $75\ kg\ K_2O\ ha^{-1}$ 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.



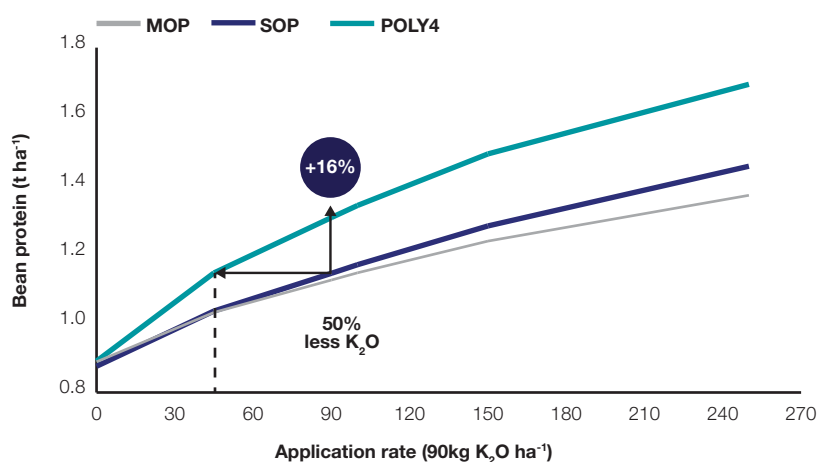
SOYBEAN TOTAL NUTRIENT UPTAKE $(kg\ ha^{-1})^{5,7}$

- 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 $90\ kg\ K_2O\ ha^{-1}$ ⁽⁶⁾.
- Using 50% less K_2O with POLY4 still maintains bean protein of $1.1\ t\ ha^{-1}$ compared to MOP at the recommended application rate of $90\ kg\ K_2O\ ha^{-1}$ ⁽⁷⁾.



Notes: 1) FAO 2017; 2) Based on the recommended rate of $90\ kg\ K_2O\ ha^{-1}$; 3) SoyaTech 2015; 4) GENSTAT regression analysis; 5) $35\ kg\ N\ ha^{-1}$ and $45\ kg\ P_2O_5\ ha^{-1}$ was added to all treatments; 6) $23\ kg\ K_2O\ t^{-1}$ grain recommendation adapted from "The Fertilizer Handbook" TFI, 1982 with a $3.6\ t\ ha^{-1}$ yield; 7) GENSTAT means results over $50\text{--}250\ kg\ K_2O\ ha^{-1}$. 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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