POLY4
A SIRIUS MINERALS PRODUCT

TRIAL RESULTS

WHEAT

JIANGSU PROVINCE, CHINA (2014)

HIGHLIGHTS

7% yield improvement over MOP.

Increased fertilizer margin by US$91/ha.

Significant improvement in nutrient uptake.

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OVERVIEW

- In 2016 China had over 24 million hectares of wheat and was the largest wheat producer in the world producing 131 million metric tonnes.[1]

TRIAL OBJECTIVE

To assess wheat response to potassium fertilization from MOP and POLY4 in China.

PARTNER: Institute of Soil Science, Chinese Academy of Science

LOCATION: Suqian, Jiangsu Province, China

YEAR: 2014

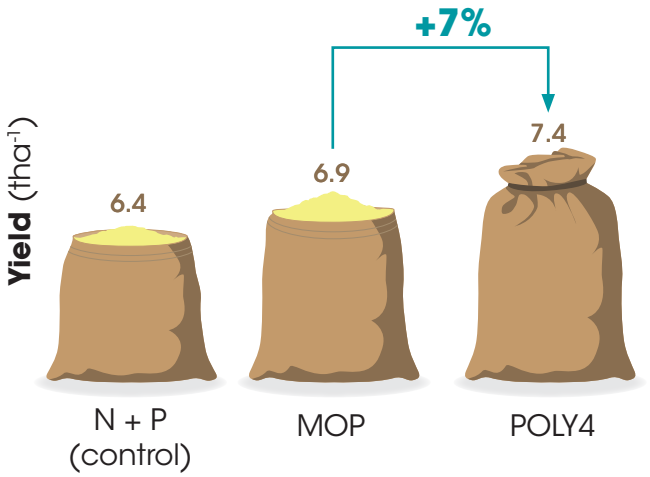
METHODOLOGY

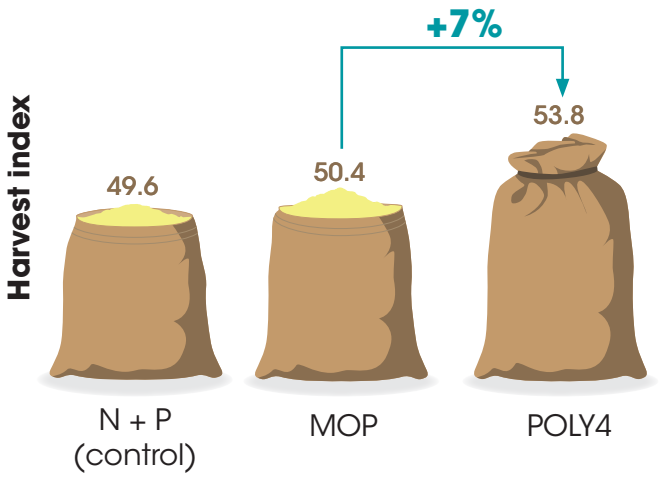
- Autumn drilled wheat field trials were carried out in central China in Suqian, Jiangsu Province.
- Soil was a silty loam.
- N and P_2O_5 were applied at local recommended rates as urea and MAP.
- Crop production with POLY4 was compared to MOP at different rates (45, 90 and 130 kg K_2O ha^{-1}). Mean data is presented.
- The trial was a randomised block design with four replications using 30 m^2 plot.

TREATMENT TABLE[2-4]

Treatment	Average nutrients applied (kg ha^{-1})						
	N	P_2O_5	K_2O	MgO	CaO	S	Cl^-
N + P (control)	140	95	0	0	0	0	0
MOP	140	95	88	0	0	0	71
POLY4	140	95	88	38	107	119	19

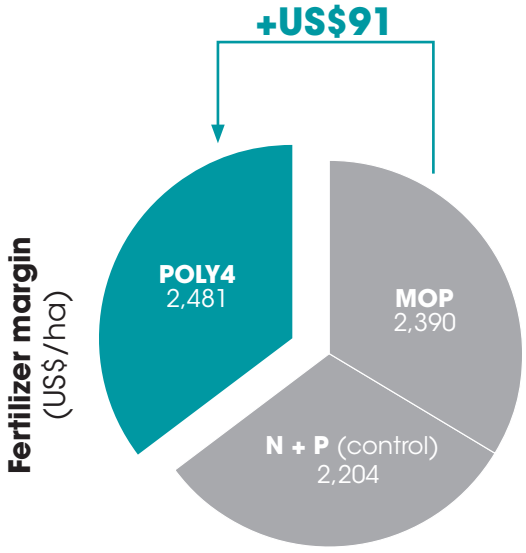
YIELD IMPROVEMENT OVER MOP[5]





- Wheat grain yield was increased by adding K from either MOP and POLY4 compared to N + P (control). However, POLY4 improved yield by 7% compared to MOP.
- Balanced crop nutrition delivered by POLY4 improved grain fill and increased the efficiency of resource allocation.

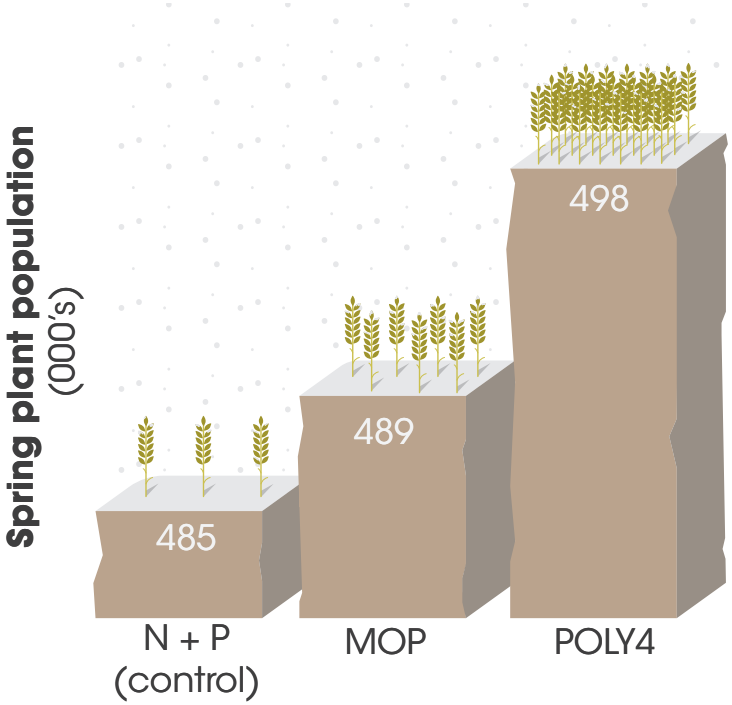
INCREASED MARGIN[6]

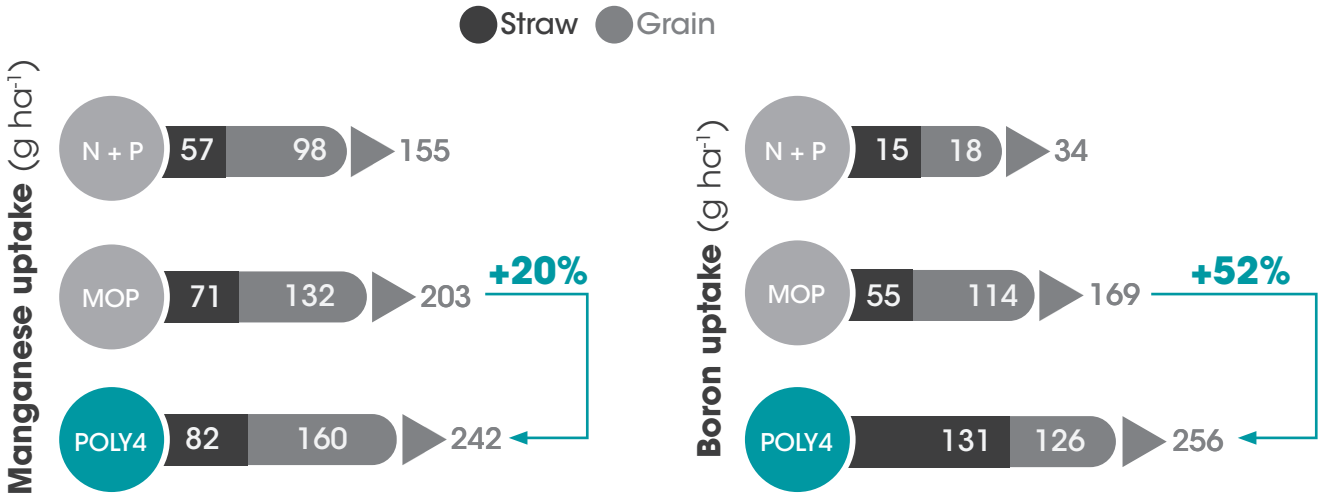


- POLY4 had the best fertilizer margin.

SIGNIFICANT IMPROVEMENT IN NUTRIENT UPTAKE

- Plant population can limit yields.
- Over-winter survival and cold tolerance of cereals was improved by good nutrition, particularly by N and K.
- POLY4 fertilizer treatment increased wheat survival through winter.





- Manganese is important for protecting plants from both abiotic and biotic stresses and for efficient photosynthesis.
- Boron is essential for good seed set.
- POLY4 significantly increased micro nutrient (Mn and B) uptake into both straw and grain compared to the no-K control and MOP.

Notes: 1) FAOSTAT data (2017); 2) All plots received 140 kg N ha^{-1} and 95 kg P_2O_5 ha^{-1} from urea and MAP; 3) Genstat means; 4) Initial soil analysis: pH 8.1; EC 429 µS cm^{-1}; 57 mg K kg^{-1}; 750 mg Ca kg^{-1}; 57 mg Mg kg^{-1}; 92 mg S kg^{-1}; 5) Results presented are based on data from Genstat ANOVA at average rate of 90 kg K_2O ha^{-1}; 6) Fertilizer prices obtained from CRU are 2014 annual prices for China: MOP (US$310/t), POLY4 (US$200/t), urea (US$278/t) and MAP (US$256/t); spreading cost (US$10.78/t) and wheat price from FAOSTAT (US$377/t). Fertilizer margin is crop output minus cost of fertilizer material and spreading.

Sources: Institute of Soil Science, Chinese Academy 2014 (20000-CAS-20011-14).

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