

TRIAL RESULTS

WHEAT

NANJING, CHINA (2015)

TRIAL OBJECTIVES

To assess the effect of POLY4 as a K_2O source on wheat yield and yield attributes, and to assess the differences in rate response between two sources.

HIGHLIGHTS

9% INCREASE IN YIELD

10% INCREASE IN TOTAL BIOMASS YIELD

ENHANCED GRAIN AND STRAW UPTAKE OF N, K, S, Mg AND Ca

INCREASE IN FARMER RETURN OF US\$24/ha

IMPROVEMENT IN WHEAT PROTEIN, A VALUABLE QUALITY TRAIT

TRIAL DESIGN

PARTNERS: NANJING INSTITUTE OF SOIL SCIENCE, CHINESE ACADEMY OF SCIENCE

LOCATION: NANJING, CHINA

YEAR: 2015

- Wheat is the third largest crop in mainland China based on hectares planted.¹
- Jiangsu province, where this trial was conducted, is one of the key wheat producing regions.
- In 2015, wheat accounted for 21% of Chinese grain production.²



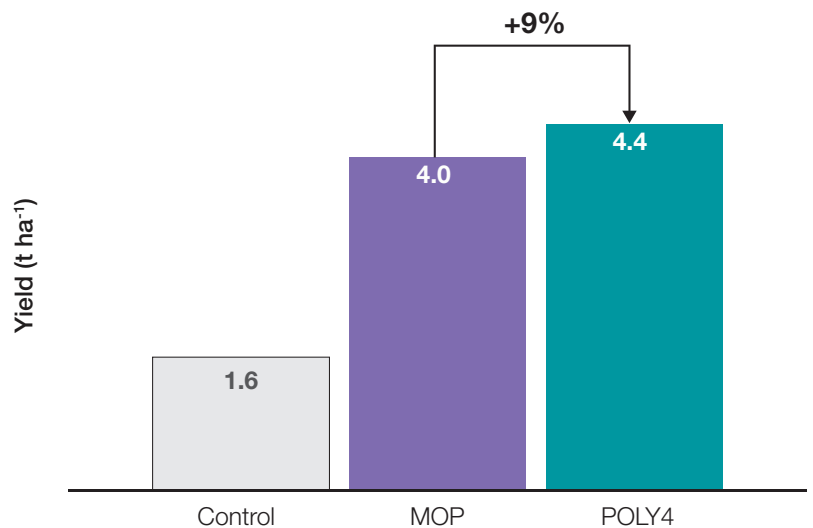
TREATMENT TABLE (kg ha⁻¹)³

NUTRIENT	AVERAGE NUTRIENT APPLIED IN TRIAL (kg ha ⁻¹)						
	N	P ₂ O ₅	K ₂ O	MgO	CaO	S	Cl
Control	180	120	0	0	0	0	0
MOP	180	120	100	0	0	0	81
POLY4	180	120	100	43	119	54	21



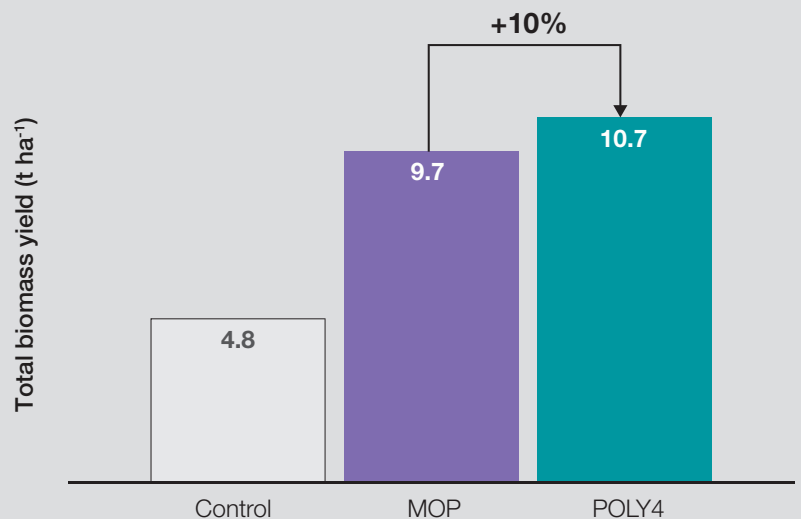
YIELD RESULT (t ha⁻¹)^{3,4,8}

- POLY4 increased wheat grain yield by 9%.
- MOP can replace potassium offtake but lacks sulphur to provide an additional yield boost.
- An increased yield from the same K₂O application rate means an improved fertilizer use efficiency.
- In this straight trial, the increased availability of potassium, sulphur, magnesium and calcium to the plant from low chloride POLY4 is shown.



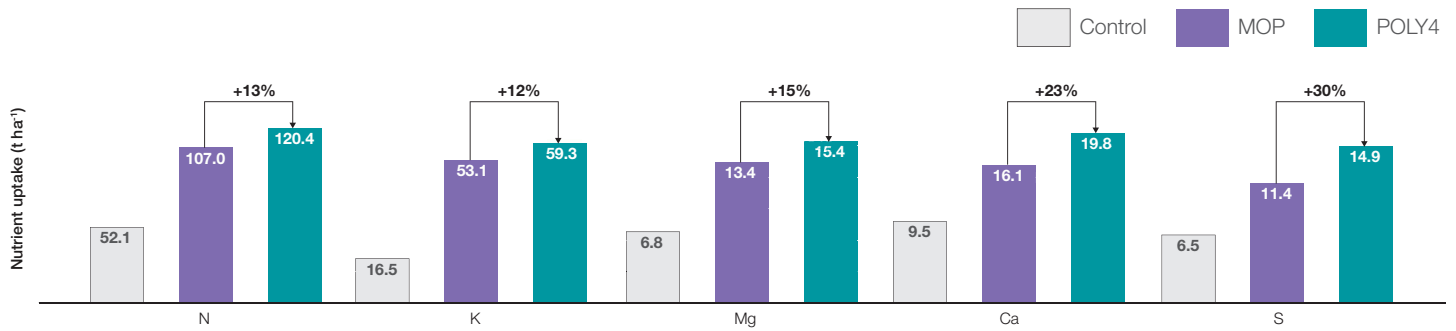
BIOMASS YIELD RESULT (t ha⁻¹)^{3,4}

- POLY4 increases plant biomass – an indicator of a taller and stronger wheat crop.
- POLY4 increased total biomass weight by 10% over MOP which can be attributed to a more balanced fertilizer plan.



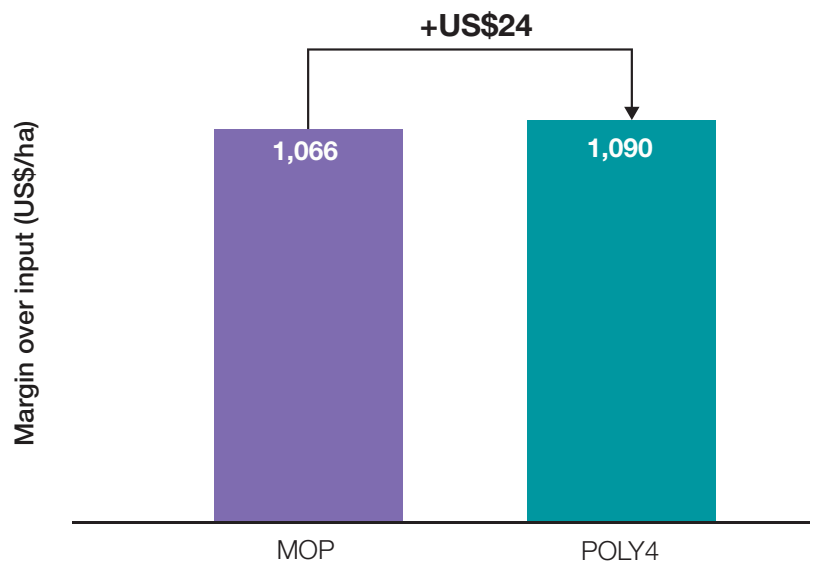
TOTAL NUTRIENT UPTAKE ^{(kg ha⁻¹)^{3,4}}

- POLY4 is shown to support fertilizer use efficiency (FUE) by improving grain and biomass nutrient uptake.
- Importantly, POLY4 ensures high FUE of nitrogen – a key element in support of the Chinese government’s zero growth policy.
- POLY4 provides an excellent source of plant-available potassium, sulphur, magnesium and calcium.



ECONOMIC SUMMARY ^{(US\$/ha)⁵⁻⁷}

- The trial setup focused on demonstrating the effectiveness of POLY4 as a potassium source.
- Accounting for an increase in the cost of the fertilizer plan in this straight trial, POLY4 still offers a more economical alternative with a margin over input increase of US\$24 per hectare to the farmer.



Notes: 1) FAO 2014; 2) Based on data available in the Chinese Statistical yearbook; 3) All plots received 180 kg N ha⁻¹ and 120 kg P₂O₅ ha⁻¹ from Urea and DAP; 4) GENSTAT means; 5) Fertilizer prices based on China 2016 annual prices: urea (US\$210/t), DAP (US\$322/t), MOP (US\$270/t), POLY4 (US\$200/t); 6) Analysis accounts for yield changes and fertilizer application cost of US\$10.78/t; 7) Wheat price fixed for 2016 at US\$342/t; 8) Initial soil analysis pH 6.7, P 21.9 mg kg⁻¹, K 43.5 mg kg⁻¹, Ca 1096 mg kg⁻¹, Mg 214 mg kg⁻¹, S 119 mg kg⁻¹, EC 0.1 S m⁻².

Sources: FAO (2017); Chinese Statistical Yearbook (2016); National Development and Reform Commission (2016); Nanjing Institute of Soil Science, Chinese Academy (2015) 20000-CAS-20016-15

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