

TRIAL RESULTS

RICE

NANJING, CHINA (2016)

HIGHLIGHTS

POLY4 increased yield.

Improved rice quality characteristics.

Greater total nutrient uptake of N, P, K, Ca, Mg and S.

Enhanced post-harvest soil nutrient legacy.



TRIAL OBJECTIVE

To compare various potassium (K) sources and monitor soil K status. To assess response of rice yield and quality to POLY4 and another potassium fertilizer.

Rice is the second highest worldwide production after maize (corn). Between 2012 and 2016 global rice production increased by 4.7 million tonnes whilst the hectares planted fell by 2.4 million hectares. This evident intensification of rice production is supported by a combination of crop management and, importantly, nutrient management practices as a yield target will only be reached when the correct amount of nutrients is supplied at the right time to match the crops nutrient requirements through the season.

China is the global top producer and consumer of rice (FAO, 2016/2017). Chinese government continues to aim stabilising the area planted with rice and wheat and to ensure self-sufficiency in the staple grains as part of their zero growth in fertilizer policy.

The top five rice producers for 2016-17 are:

Country	Production (Million metric tonnes)	Exports (Million metric tonnes)
China	144.95	0.81
India	109.70	11.77
Indonesia	36.86	0.00
Vietnam	27.40	6.49
Thailand	19.20	11.62

OVERVIEW

PARTNER: NANJING INSTITUTE OF SOIL SCIENCE, CHINESE ACADEMY OF SCIENCES
LOCATION: NANJING, CHINA
YEAR: 2016

- China is the largest producer of rice in the world.¹
- Potassium fertilizers are required for efficient rice production.
- Field experiments were carried out in Jiangyan District, Jiangsu Province, China.
- Experiments were conducted on a low K content sandy soil.
- N and P₂O₅ were applied at local recommended rates with K₂O applied at 0, 70, 140 and 210 kg K₂O ha⁻¹.^{3,4} The data presented in the factsheet is the average of these.

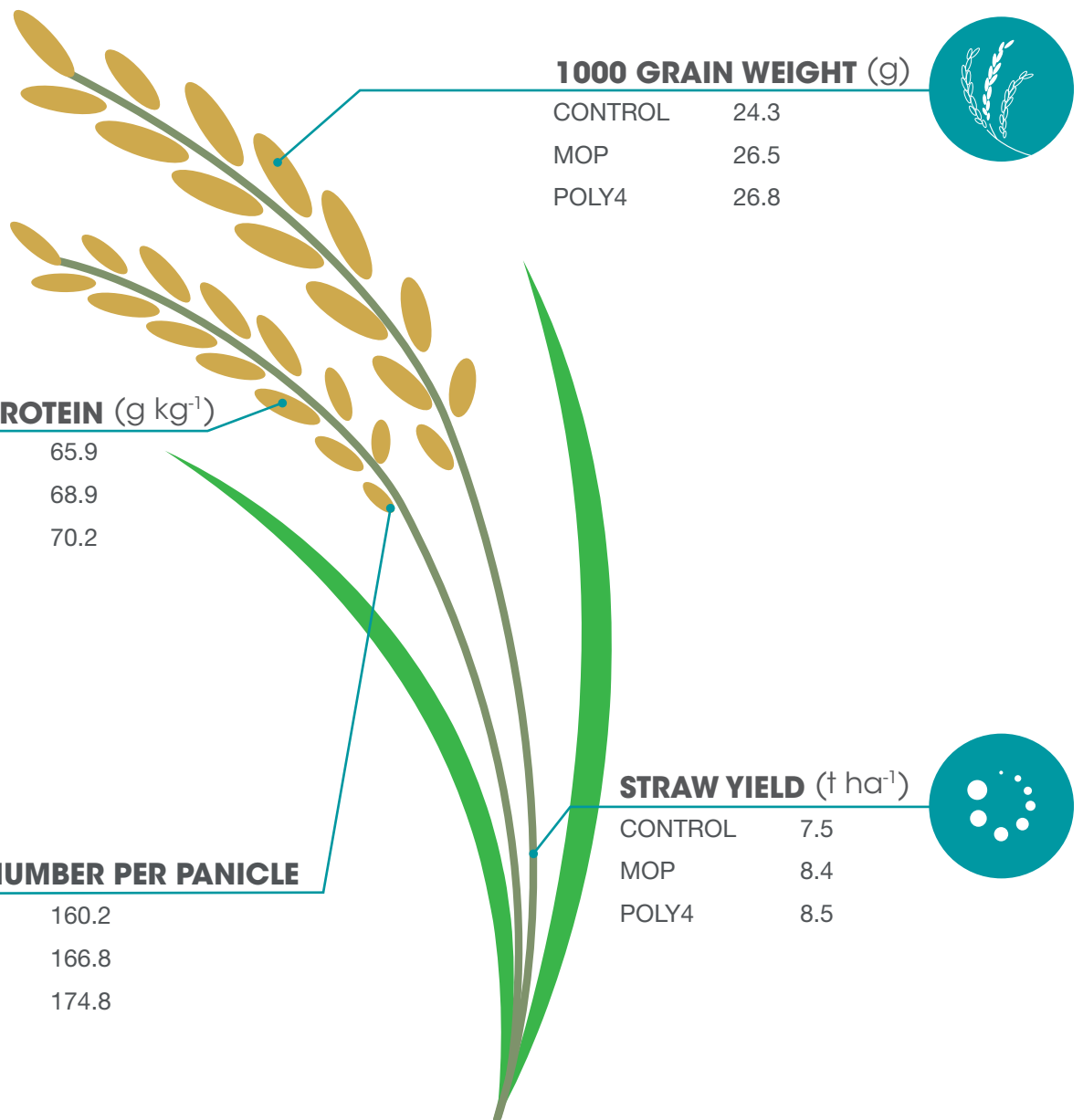
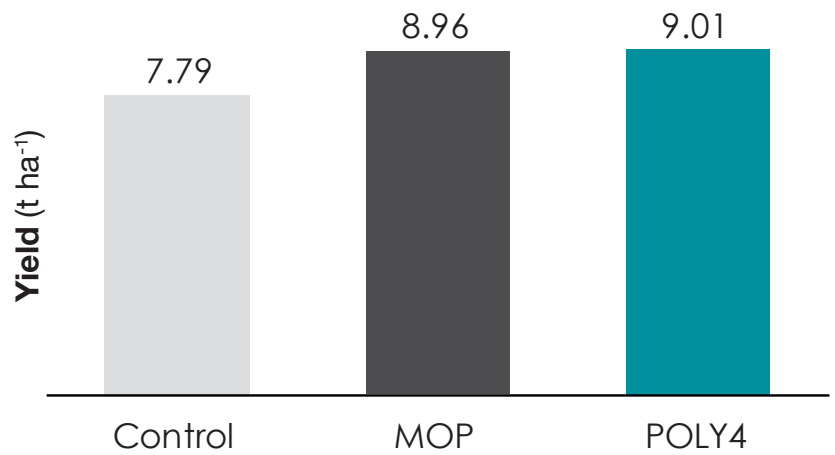
TREATMENT TABLE^{2,3}

TREATMENTS	NUTRIENTS APPLIED (kg ha ⁻¹)				
	K ₂ O	CaO	MgO	S	Cl ⁻
Control	0	0	0	0	0
MOP	70 – 210	0	0	0	56 – 168
POLY4	70 – 210	84 – 251	30 – 90	96 – 287	15 – 45

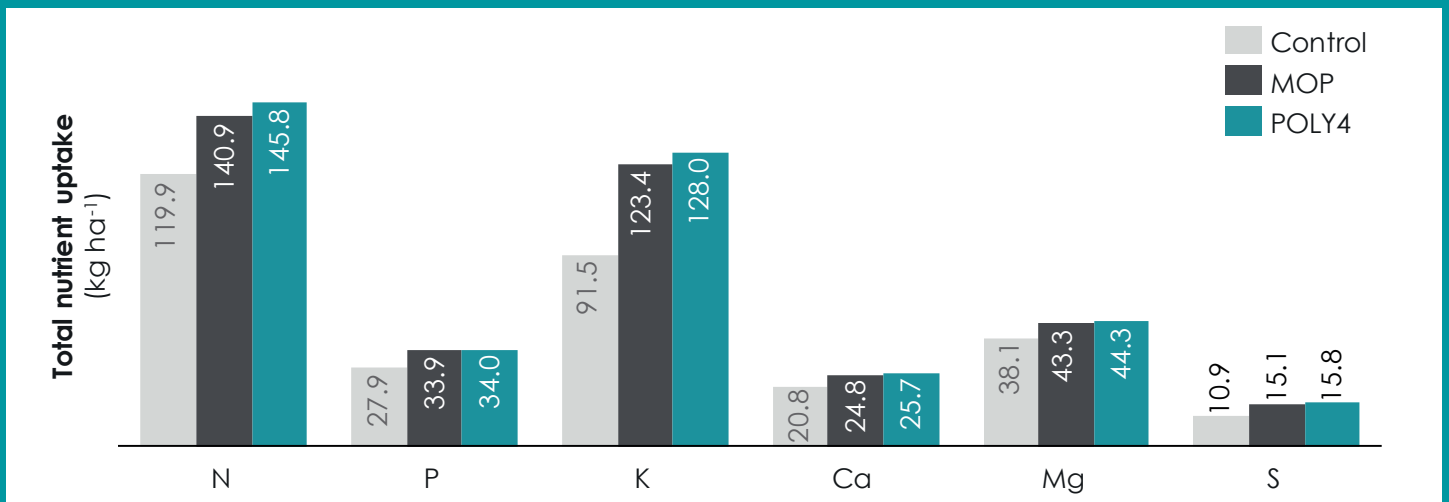


YIELD AND QUALITY^{2,3}

- Potassium application significantly elevated rice yield.
- Rice fertilized with POLY4 had better quality characteristics and produced higher yield.



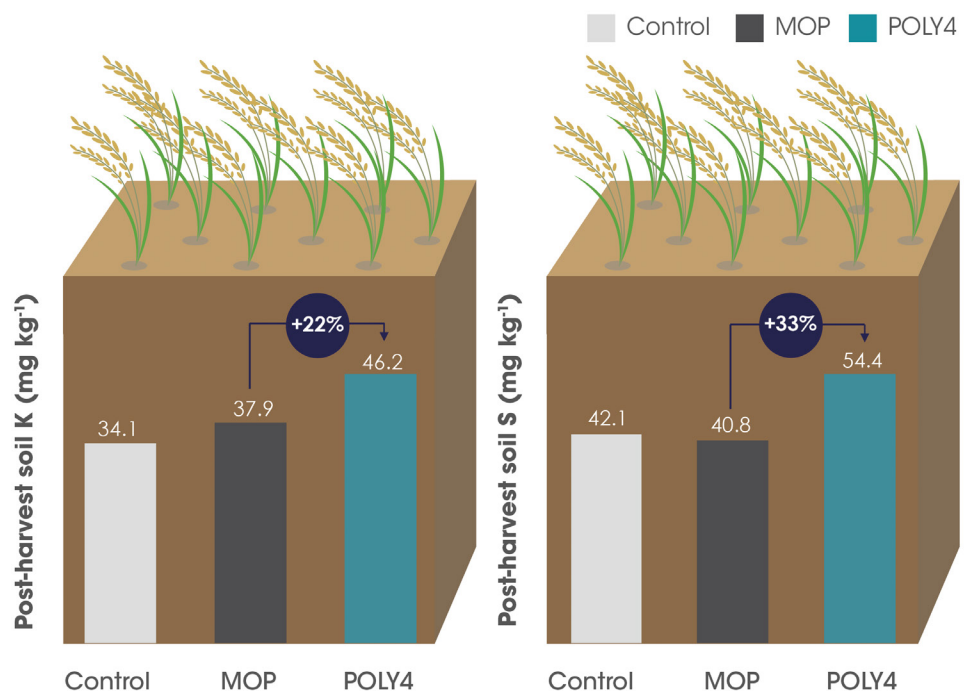
TOTAL NUTRIENT UPTAKE^{2,3}



- Rice fertilized with POLY4 had higher macro-nutrient uptake.
- Greater N and K uptake suggests POLY4 increased the fertilizer use efficiency of these nutrients.

POST-HARVEST SOIL STATUS^{2,3}

- POLY4 significantly increased post-harvest available K and S in the top soil (0-20cm).
- Increased nutrient status can carry over benefits for subsequent cropping.



Notes: 1) Tonnage of rice production in 2014 according to FAOSTAT (2017); 2) GENSTAT means; 3) All plots received 225 kg N ha⁻¹ and 120 kg P₂O₅ ha⁻¹ from urea and DAP. Initial soil analyses (0 – 20 cm) pH 6.7 ; P 22 mg kg⁻¹, K 44 mg kg⁻¹, Ca 1096 mg kg⁻¹, Mg 214 mg kg⁻¹, S 119 mg kg⁻¹, B 0.08 mg kg⁻¹, Mo 0.92 mg kg⁻¹, Zn 0.64 mg kg⁻¹, EC 1007 uS cm⁻¹.

Source: Nanjing Institute of Soil Science Chinese Academy of Sciences (2015) 20000-CAS-20016-15

siriusminerals.com | +44 1723 470 010 | commercial@siriusminerals.com

Registered Address: 3rd Floor Greener House, 66–68 Haymarket, London SW1Y 4RF, UK

Company Registered Number: 4948435

