POLY4
A SIRIUS MINERALS PRODUCT

TRIAL RESULTS

TEA

SICHUAN, CHINA (2016)

HIGHLIGHTS

POLY4 improved tea quality and taste parameters.

Improved leaf yield of 5%.

POLY4 reduced polyphenol to amino acid ratios by 12%, which improved taste.

Significant improvements in residual soil nutrients: calcium by 34% and magnesium by 58%.

TRIAL OBJECTIVE

Continue a second year of tea crop assessments comparing POLY4 and SOP.

OVERVIEW

PARTNER: SOIL AND FERTILIZER INSTITUTE, SICHUAN ACADEMY OF AGRICULTURAL SCIENCE, SICHUAN PROVINCE, CHINA

LOCATION: SICHUAN, CHINA

YEAR: 2016

- Tea is a high-value tropical crop that benefits from a low-chloride fertilizer.
- Indonesia, India, China, Sri Lanka and Kenya were the largest tea-exporting countries in 2016.[1]
- During this period, China produced 2.35 million metric tonnes of tea and exported tea valued at approximately US$ 1.49 billion, making it the leading exporter of tea worldwide.[1]
- The variety of tea trialled was Wuniuzao. This second-year trial continued to validate the effect of POLY4 on crop's growth and quality.
- Potassium was applied at rates of 90,135,180 and 270 kg K_2O ha^{-1}. The factsheet presents the average results from these treatments.
- N and P were applied at recommended rates with urea and DAP.[2]
- 50% N, 100% P and 50% K were applied as base dressings with the remainder applied as top dressing.

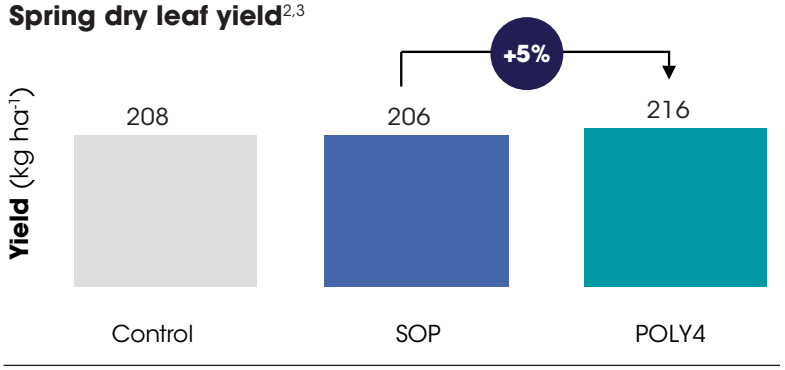
TREATMENT TABLE[2,3]

Treatments	Average nutrient applied in trial (kg ha^{-1})						
	N	P_2O_5	K_2O	CaO	MgO	S	Cl-
Control	240	120	0	0	0	0	0
SOP	240	120	169	0	0	61	10
POLY4	240	120	169	201	72	230	36

SPRING TEA YIELD

- SOP is the standard option for supplying potassium along with sulphur and limiting chloride input.
- POLY4 offers an alternative fertilizer choice that limits chloride input and delivers potassium, calcium, magnesium and sulphur in one product.
- The POLY4 plan improved dry spring leaf yield by 5% compared to SOP.

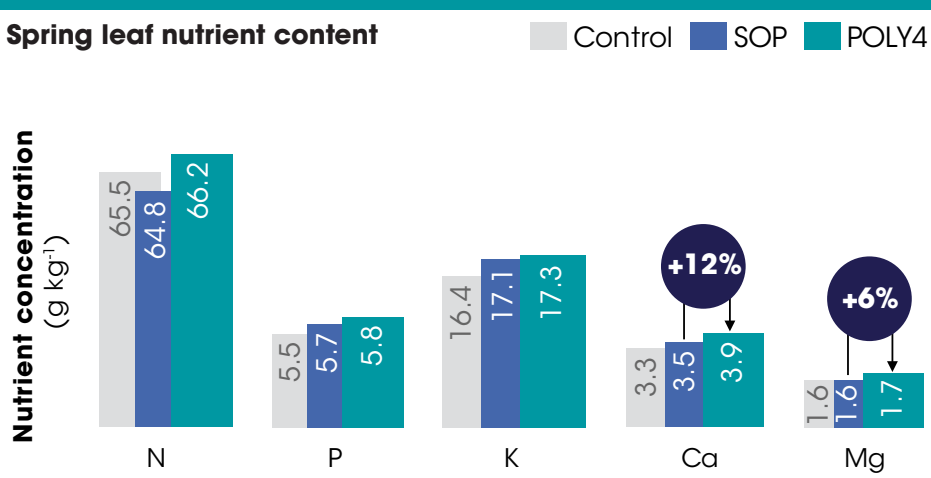
Spring dry leaf yield[2,3]



NUTRIENT CONCENTRATION IN LEAVES

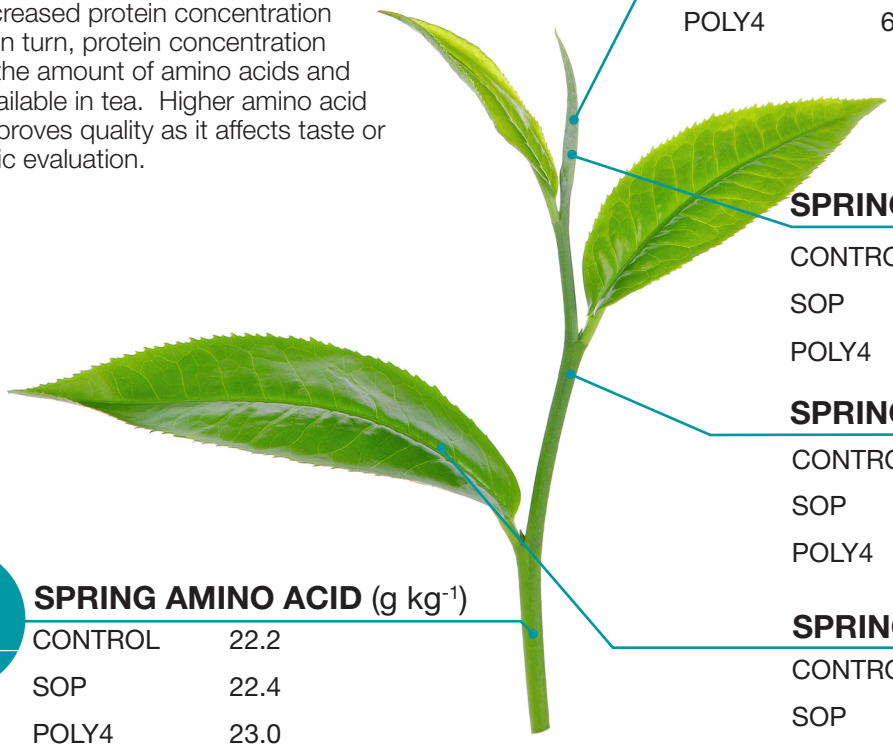
- Fertilization with POLY4 improved concentration of macro nutrients in tea leaves.
- Magnesium concentration was increased by 6%, which is important for tea quality as it helps to improve taste and flavour.

Spring leaf nutrient content



TEA QUALITY

Potassium is important for tea crops, as an enzyme activator it can improve tea quality through increased protein concentration in leaves. In turn, protein concentration can affect the amount of amino acids and caffeine available in tea. Higher amino acid content improves quality as it affects taste or organoleptic evaluation.



SPRING BUD DENSITY (buds m^{-2})

CONTROL	563
SOP	624
POLY4	647

SPRING BUD LENGTH (cm)

CONTROL	2.32
SOP	2.50
POLY4	2.57

SPRING PROTEIN ($g\ kg^{-1}$)

CONTROL	345
SOP	360
POLY4	368

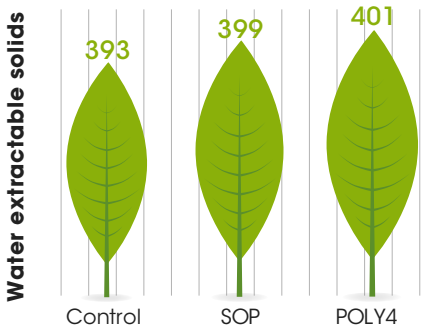
SPRING AMINO ACID ($g\ kg^{-1}$)

CONTROL	22.2
SOP	22.4
POLY4	23.0

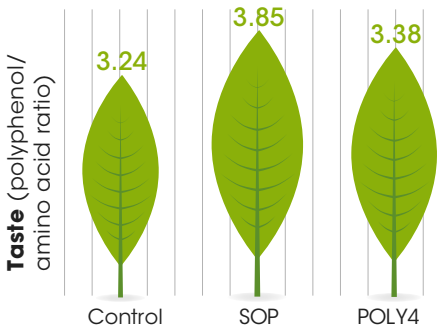
SPRING LEAF AREA (cm^2)

CONTROL	1.49
SOP	1.56
POLY4	1.87

Spring leaf water extractable solids[2,3]



Spring leaf taste assessment[2,3]

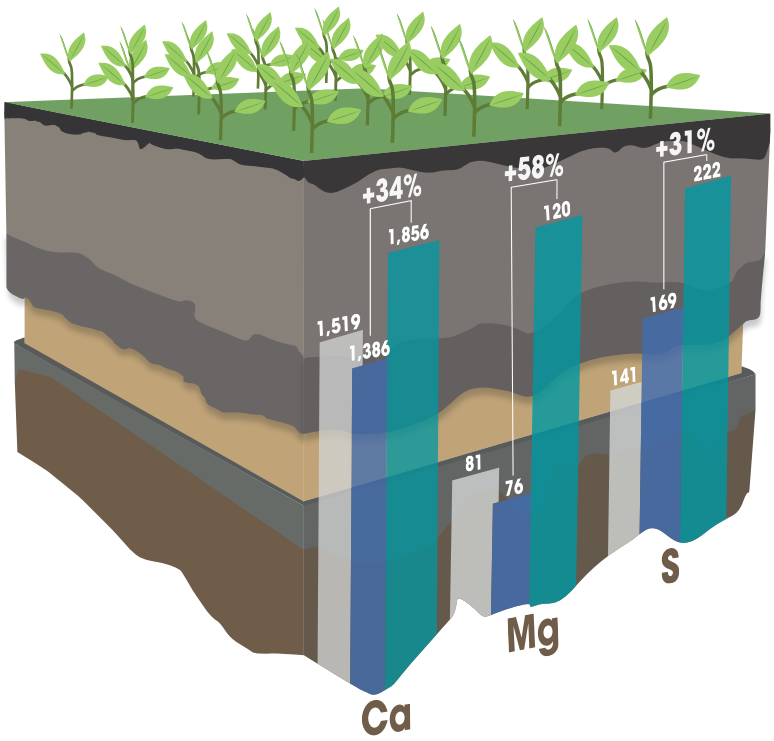


- Application of POLY4 improved a number of parameters that support tea quality and yield.
- Larger leaves and higher number of buds improved yield.
- POLY4 treatment improved spring leaf protein and amino acid content in tea.
- POLY4 also decreased the ratio of polyphenols to amino acids by 12% in spring leaf – lower ratios offer a fresh, less acidic taste.

POST-TRIAL SOIL ANALYSIS[3]

Soil nutrient concentration (mg kg^{-1})

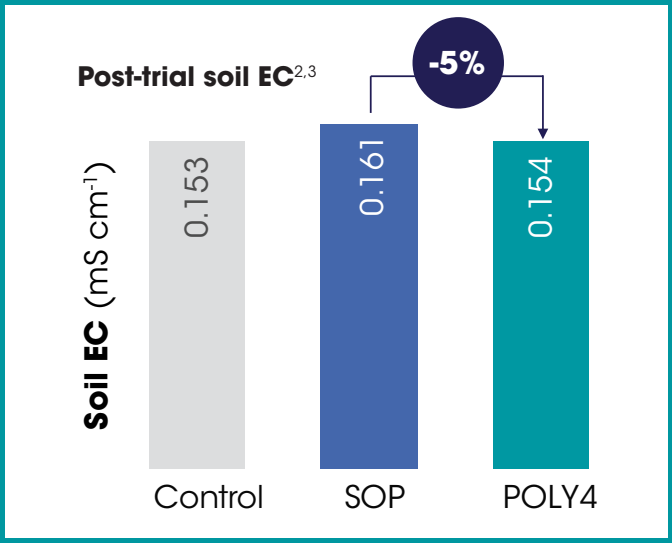
Control SOP POLY4



- Maintaining nutrients in soil after harvest is important for crop rotations and beneficial for future seasons.
- POLY4 showed significant increases in residual soil nutrients compared to SOP: testing showed increase in sulphur by 31%, calcium by 34% and magnesium by 58%.

POST-TRIAL SOIL ELECTRICAL CONDUCTIVITY

- Soil samples taken after the trial showed that POLY4 had less impact on soil EC (electrical conductivity) than SOP. This can improve long-term soil health. EC is also important to the ease with which plants uptake water, which affects nutrient uptake and subsequently yield.



Notes: 1) Statista, Production of tea worldwide from 2006 to 2016 (2017); 2) All plots received 240 kg N ha^{-1} and 120 kg P_2O_5 ha^{-1} from urea and DAP; 3) GENSTAT mean results. Initial soil analysis: pH 4.6, EC 1380 µS cm^{-1}, N 102 mg kg^{-1}, P 7 mg kg^{-1}, K 57 mg kg^{-1}, Ca 1602 mg kg^{-1}, Mg 88 mg kg^{-1}, S 127 mg kg^{-1}

Sources: Soil and Fertiliser Institute, Sichuan Academy of Agricultural Science (2016) 19000-SAAS-19014-15

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

SIRIUS MINERALS PLC