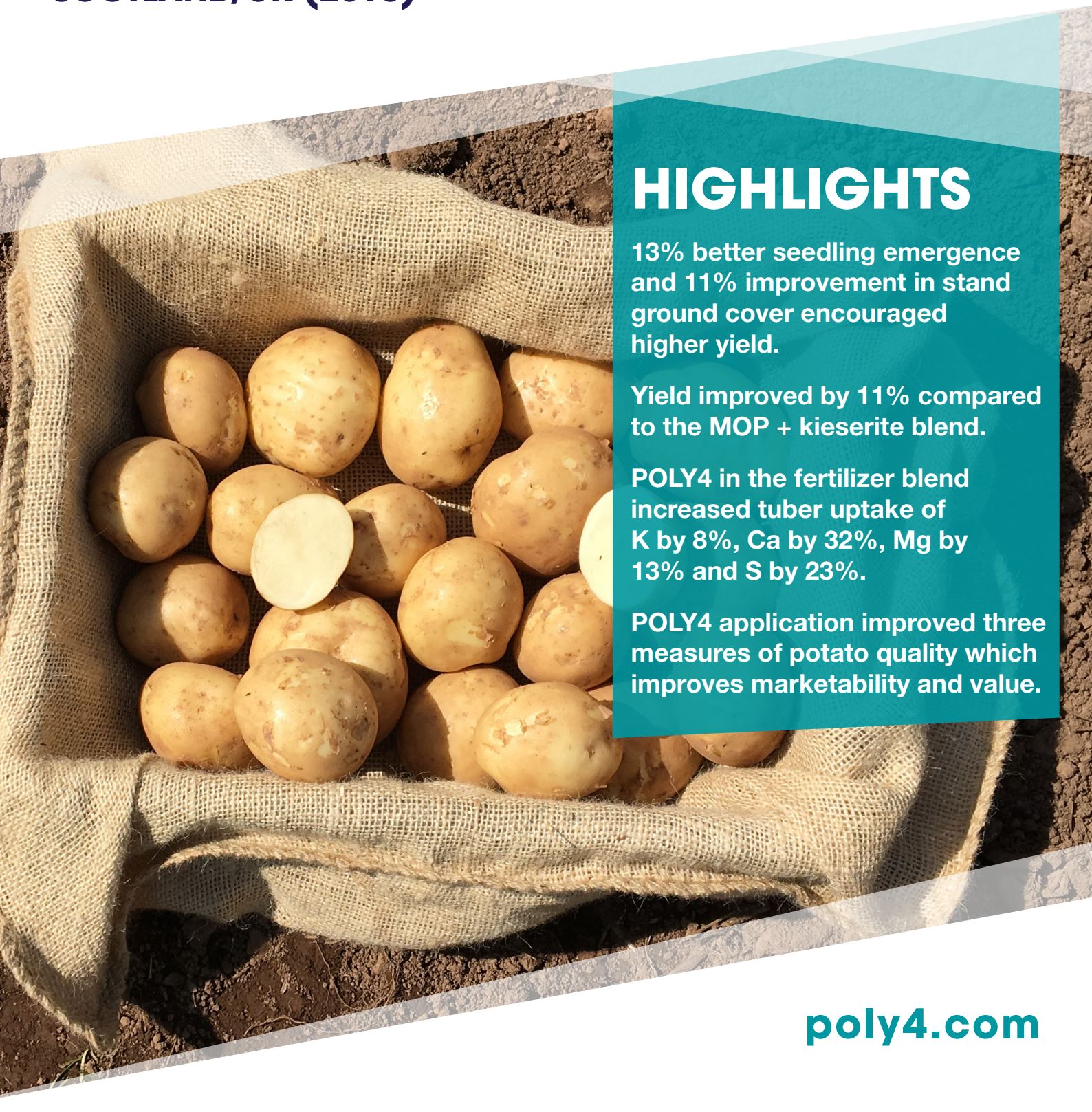
POLY4
A SIRIUS MINERALS PRODUCT

TRIAL RESULTS

POTATO

SCOTLAND, UK (2015)



HIGHLIGHTS

13% better seedling emergence and 11% improvement in stand ground cover encouraged higher yield.

Yield improved by 11% compared to the MOP + kieserite blend.

POLY4 in the fertilizer blend increased tuber uptake of K by 8%, Ca by 32%, Mg by 13% and S by 23%.

POLY4 application improved three measures of potato quality which improves marketability and value.

poly4.com

TRIAL OBJECTIVE

To assess the response of potato yield and quality to the use of POLY4.

FAO reports that in 2016 the five leading countries for potato production worldwide were:

COUNTRY	Production (Million metric tonnes)
China, mainland	99.07
India	43.77
Russia	31.11
Ukraine	21.75
USA	19.99

OVERVIEW

PARTNER: SAC CONSULTING

LOCATION: SCOTLAND, UK

YEAR: 2015

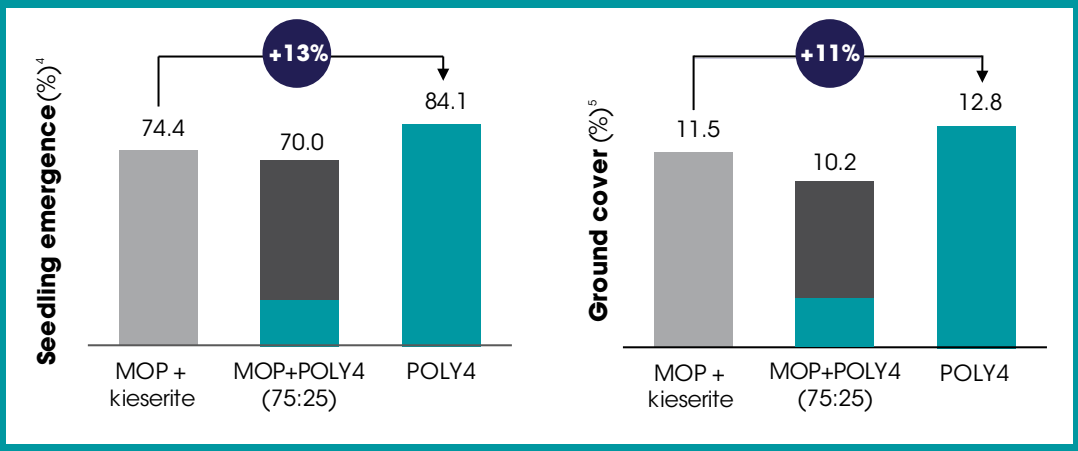
- According to FAO data European Union produced 56 million metric tonnes (Mmt) of potatoes in 2016.
- In 2016, Germany was the largest EU producer, with a share of 10.77 Mmt, followed by Poland (8.87 Mmt), France (6.83 Mmt) and Netherlands (6.53 Mmt).[1]
- The United Kingdom produced 5.37 Mmt of potatoes in 2016.[1]
- The trial was conducted in north-east Scotland under rainfed conditions.
- The potato variety used was Casablanca – an early maturing variety suitable for frying.
- The performance of a commercial potato crop grown with K fertilizer from POLY4, POLY4 + MOP or MOP + kieserite was tested.
- Results presented are averages of the data.

TREATMENT TABLE[2,3]

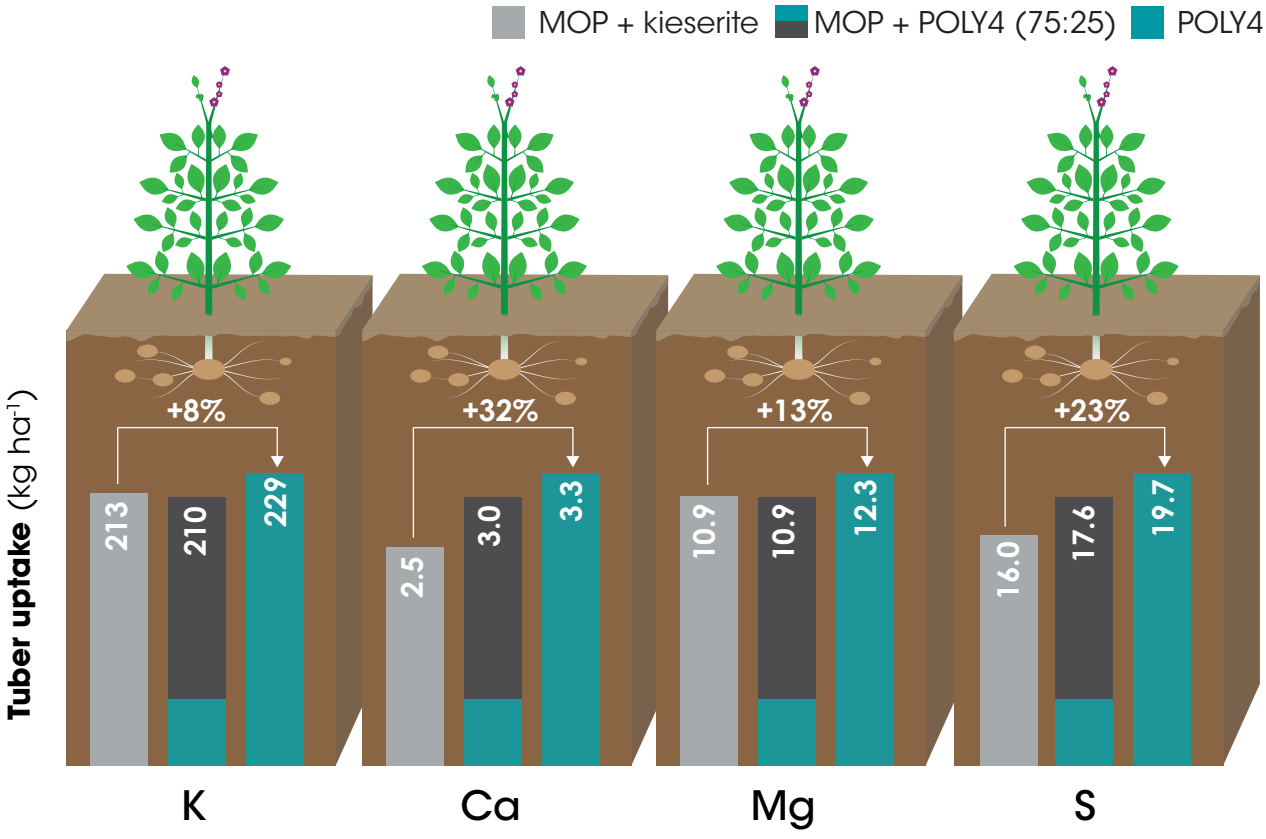
Nutrient	Nutrient applied in trial (kg ha^{-1})						
	N	P_2O_5	K_2O	CaO	MgO	S	Cl^-
MOP + kieserite	160	150	200	65	21	10	133
MOP + POLY4 (75:25)	160	150	200	126	21	68	111
POLY4	160	150	200	308	86	272	43

EARLY CROP GROWTH[2,3]

- POLY4 has a lower salt index than MOP which benefits emergence and early growth of potatoes.
- POLY4 increased seedling emergence[5], ground cover[6] and crop uniformity which can increase light interception and shading of weeds, and produce greater crop yields.



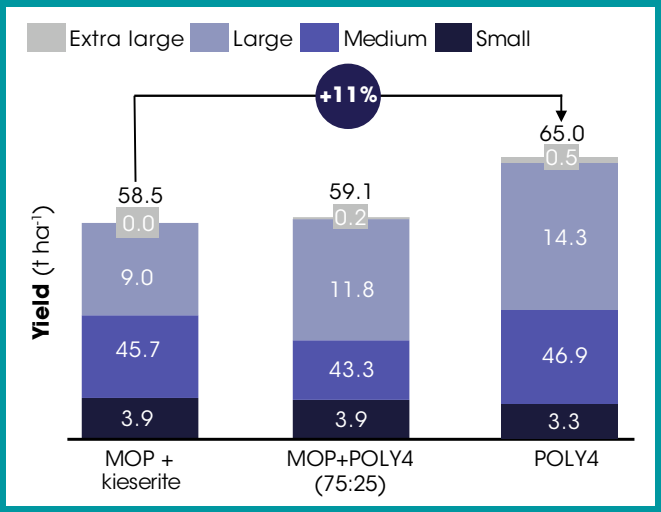
TUBER NUTRIENT UPTAKE[2,3,6]



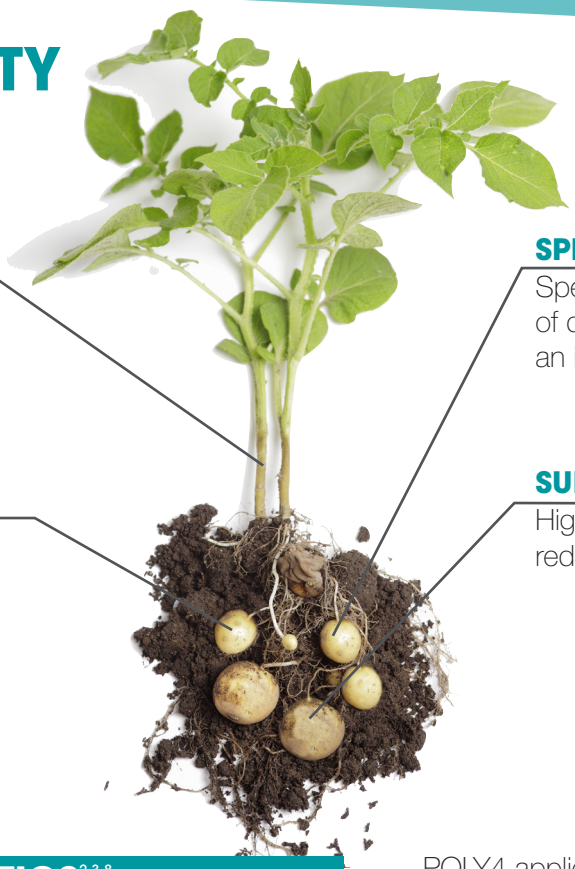
- Potassium can increase potato yield because it supports the transport of sugar from the leaves to tubers.
- Calcium strengthens cell structure which improves skin quality and stress tolerance.
- Increased magnesium uptake results in larger tubers with greater starch and protein contents.
- Good sulphur availability ensures efficient use of nitrogen.
- POLY4 was not only an effective K fertilizer, but also increased uptake of Ca, Mg and S.

POTATO YIELD[3,4,7]

- Compared to the MOP + kieserite option, the POLY4 fertilizer programme increased potato yield from 58.5 to 65 t ha^{-1} and increased the proportion of the processing grades.
- For example, French fry processors prefer standard sized potatoes (typically 45 mm to 85 mm in length: equivalent to the medium and large sizes of the presented categories).



POTATO QUALITY



SENESCENCE (score)
A higher senescence score demonstrates a more mature plant.

BRIGHTNESS (score)
Tuber brightness is an indication of tuber health and disease resilience.

SPECIFIC GRAVITY (% DM)
Specific gravity is an indicator of dry matter content which is an important trait for frying.

SURFACE DISEASE (score)
High surface disease scores reduce market value.

POTATO CHARACTERISTICS[2,3,8]

Quality parameter	Fertilizer plan		
	MOP + kieserite	MOP + POLY4 (75:25)	POLY4
Specific gravity (% DM)	19.4	19.6	19.3
Surface disease (score)	3.3	2.0	2.0
Senescence (score)	5.5	7.3	8.5
Brightness (score)	6.0	6.8	6.5

POLY4 application improved three of the four measures of potato quality. Greater tuber quality typically delivers improved marketability and value.

Notes: 1) FAOSTAT (2016) 2) Based on recommendation application of 200 kg K_2O ha^{-1}. Initial soil analysis: pH 5.9, P 8 mg kg^{-1}, K 99 mg kg^{-1}, Mg 86 mg kg^{-1}; 3) GENSTAT means 4) Stand emergence observations 46 days after planting; 5) Ground cover observations taken 54 days after planting; 6) Tuber nutrient uptake assessed on 10 February 2016; 7) Small <45mm diameter, medium = 45 – 65 mm diameter, large = 65-85 mm diameter, extra large>85mm diameter; 8) Measurements conducted on 16 December 2015 except for senescence on 31 August 2015.

Source: SAC (2015) 16000-SAC-16011-15

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