SIRIUS MINERALS PLC

THE FUTURE OF FERTILIZER

Agronomy Update
January 2014

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Content

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By 2030 more than half of the global food demand will be driven by the rapidly emerging middle class

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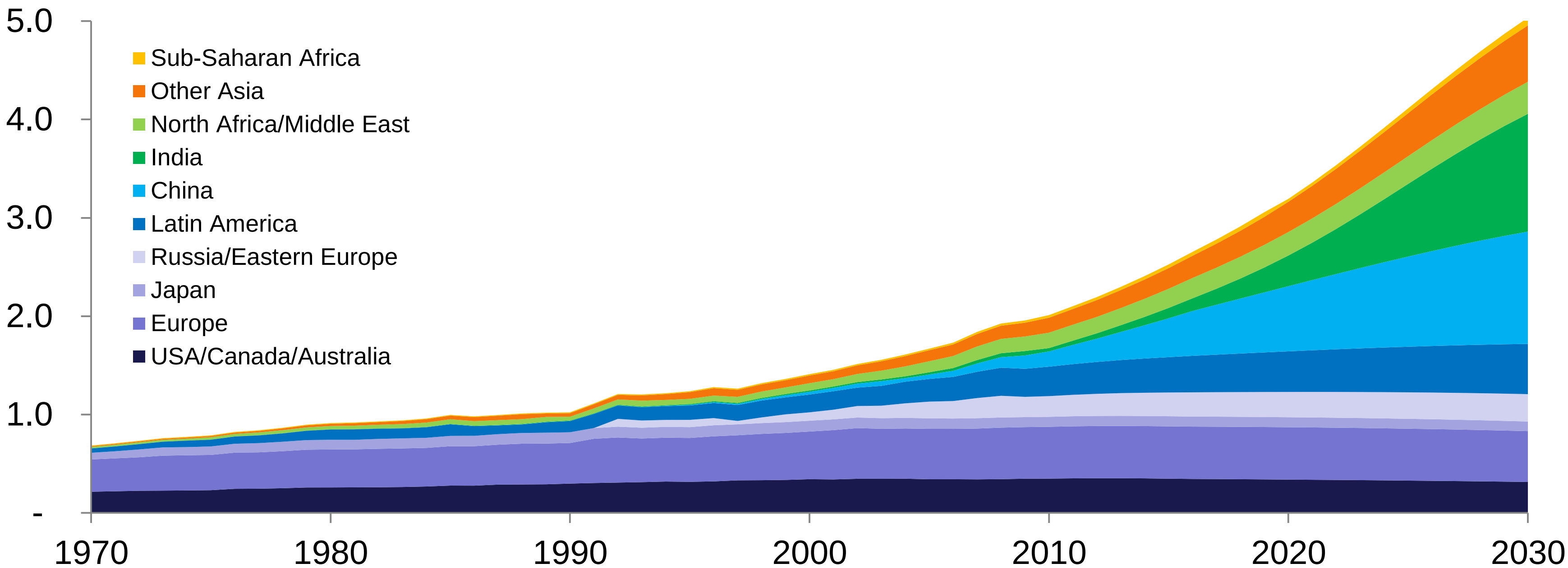
1 **Middle Class food consumption 1970-2030[1]**
(Kcal consumption in quadrillions)



	1970	1980	1990	2000	2010	2020	2030
% global food consumption	19	20	19	22	28	39	55
Middle Class population (Bn people)	0.7	0.9	1.0	1.3	1.9	3.0	4.6

An innovative bulk fertilizer solution is critical to increasing food demands

Notes: 1) Middle Class defined as the number of people earning or spending between US$10 and US$100 per day at 2005 PPP US$
Source: Pardee Center; UN; FAO; OECD; Brookings Institution; Sirius Minerals

A 2010-2030 fertilizer consumption forecast based on historical correlation data shows a 22% growth

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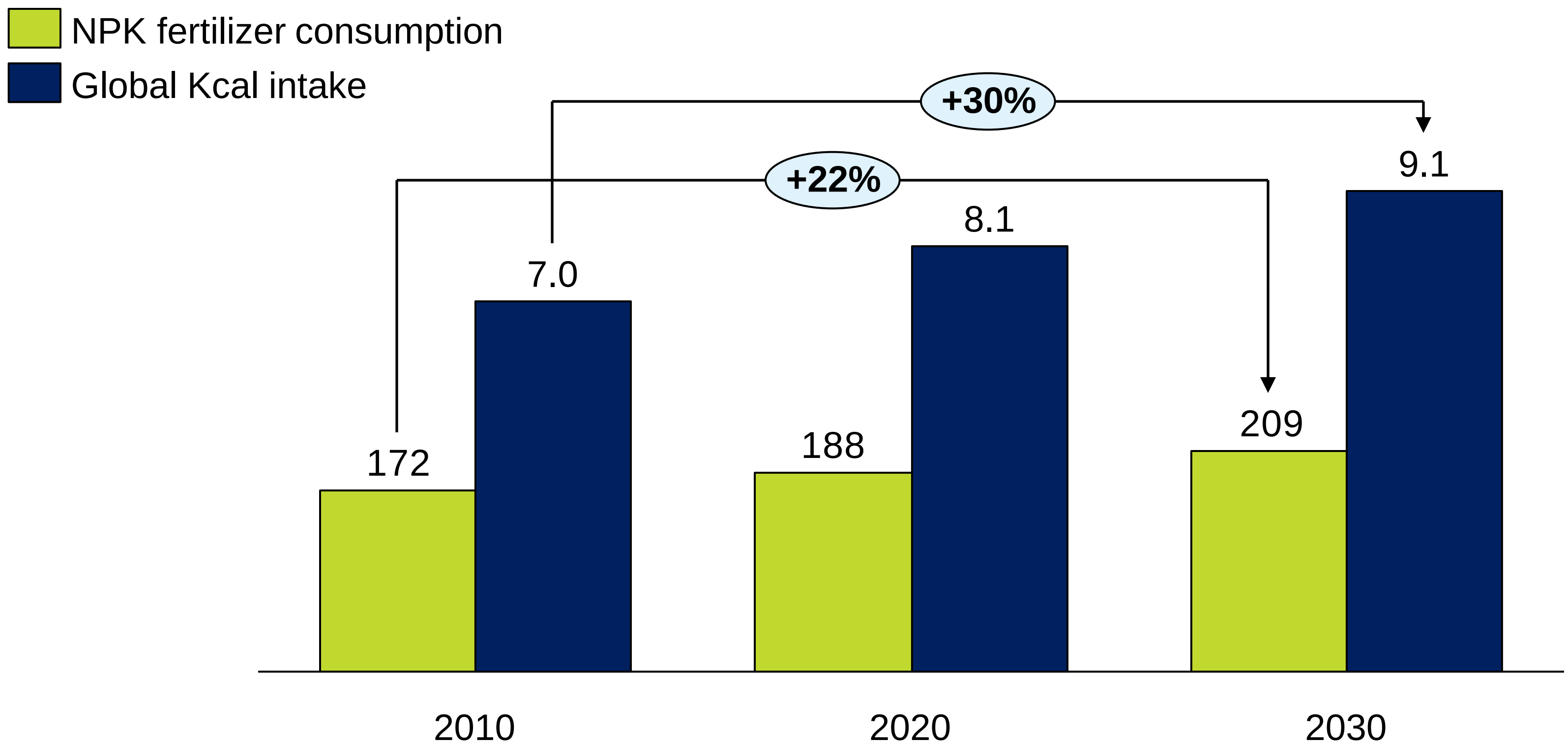
Forecasted global NPK fertilizer and food consumption 2010 -2030
(Million tonnes nutrients, Kcal consumption in quadrillions)



Conservative base case demand as future fertilizer demand is expected to get an additional boost due to new challenges with water, land, soil, and climate

Sources: UN; World Bank; IFA; Sirius Minerals

Increased food production needs to be achieved in the daunting face of four key issues

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Issue	Impact on the food security challenge
Water scarcity	▪ The combined impact of population growth, increased wealth and urbanisation are forecast to cause a 27% water deficit by 2025
Arable land scarcity	▪ Global population growth combined with no new arable land has led to a 25% decline in arable land per capita from 2010 to 2050 ▪ New farmland is available, but changing use of land will accelerate climate change
Productivity	▪ Annual crop yield increase has declined from 2.2% in 1960s to 1.2% in 2000s ▪ Key driver is increased multi-nutrient deficiencies in major agricultural markets
Climate change	▪ Higher temperatures, increasing floods and droughts are forecast to result in a 2-16% yield decrease by 2080

Meeting future food demand requires food to be produced on the same amount of land, with less water requiring improved crop nutrition

Sources: World Bank; FAO; United Nations; Sirius Minerals

POLY4 is at the heart of balanced fertilization as it supplies four essential nutrients in one granule

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Four of the six macro-nutrients[1]

Polyhalite

Nitrogen (N)	Phosphorus (P)
Potassium (14% K_2O)	Sulphur (19% S)
Magnesium (4% Mg)	Calcium (12% Ca)

POLY4 key differentiators

- ✓ Balanced nutrient supply that enhances NUE and yields
- ✓ Can be used as part of a complete fertilizer for the crop, or applied directly to the soil
- ✓ Nutrients are rapidly available for plant uptake
- ✓ Organically approved and environmentally-friendly fertilizer product[2]
- ✓ Essentially chloride-free (<2%)
- ✓ Does not change soil pH regardless of application rate

POLY4 is a natural source of K, S, Mg and Ca

Notes: 1) Based on 90% polyhalite grade. 2) Registered organic material within EC regulation 834/2007

Content

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A global crop and technical research program

Committed to demonstrating the value of polyhalite

Programme fundamentals

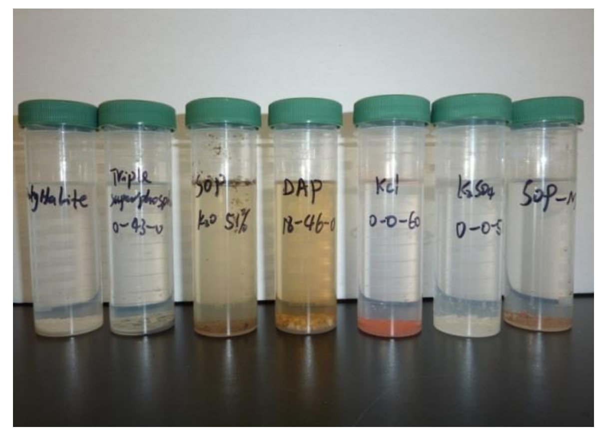
- International team of scientists and well-known laboratories with competence in plant nutrition, soil science, plant physiology and technical fertilizer knowledge
- Technical research programme seeks to characterise the physical and chemical properties of polyhalite
- Crop and specific local benchmark studies to map yield and quality performance of polyhalite fertilizers versus commercial fertilizers

Key objectives

- Technical research programme to characterise its polyhalite product, POLY4, and to underpin the value as a commercial fertilizer
- Agronomic programme to support and educate farmers by providing recommended application levels by crop, location and growing conditions
- To develop crop nutrition strategies that will create a sustainable and profitable benefit for the farmer

Crop Study Programme

Technical Research Programme



Content

1. Need for Polyhalite

2. Global Research Programme

3. **Crop Study Results**
    - **a) Crop Study results Durham University**
        - i. Wheat
        - ii. Oilseed Rape
        - iii. Cotton
    - b) Crop Study results Shandong Agricultural University
        - i. Corn
        - ii. Peanuts
    - c) Conclusion

4. POLY4 Product Characteristics
    - a) Solubility
    - b) Nutrient Release
    - c) pH Analysis
    - d) Soil Conductivity
    - e) Conclusion

Wheat (Gallant) pot study

Superior early weight as a result of natural synergy within polyhalite nutrients

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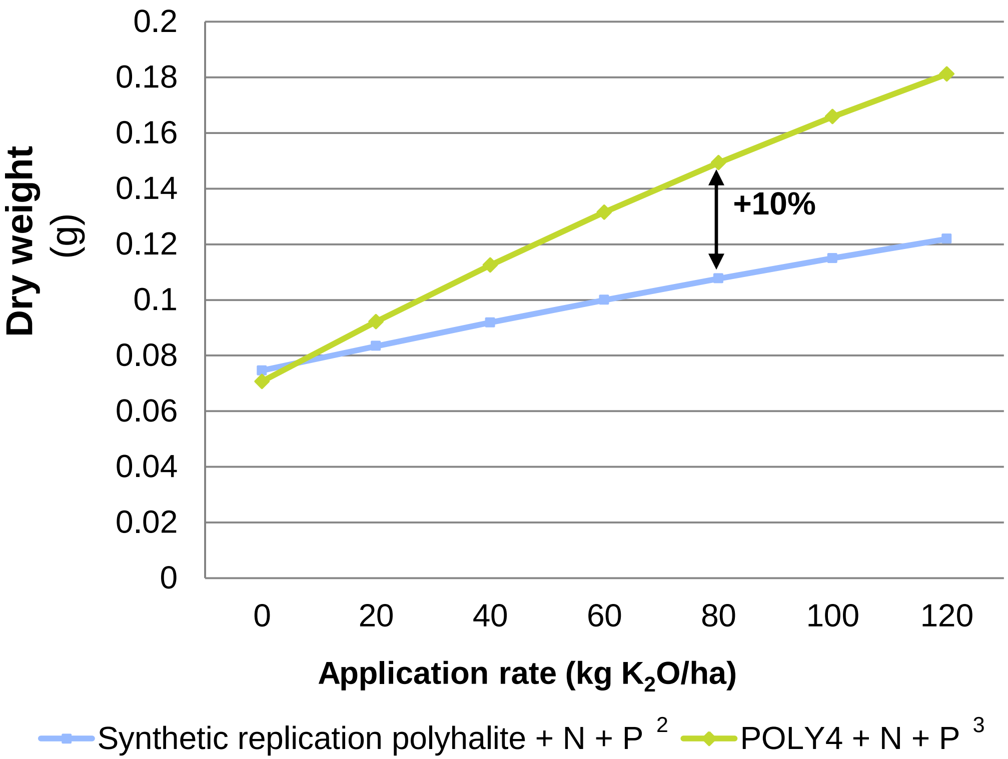
1 Wheat (Gallant) dry weight [1] (in grams)



2 Key findings

- POLY4 outperforms the sum of its parts on low and high application rates
- POLY4 shows a significantly higher dry weight (10%) in comparison with the synthetic replication at 80kg/ha K_2O in this study
- Nutrient balanced pot study indicates synergism of the individual nutrients in POLY4
- Objective to compare POLY4 with the synthetic replication of the polyhalite nutrient composition, by mixing the sulphate of potash (SOP), calcium (CaO) and magnesium, in order to identify the advantage of one natural occurring multi-nutrient ore

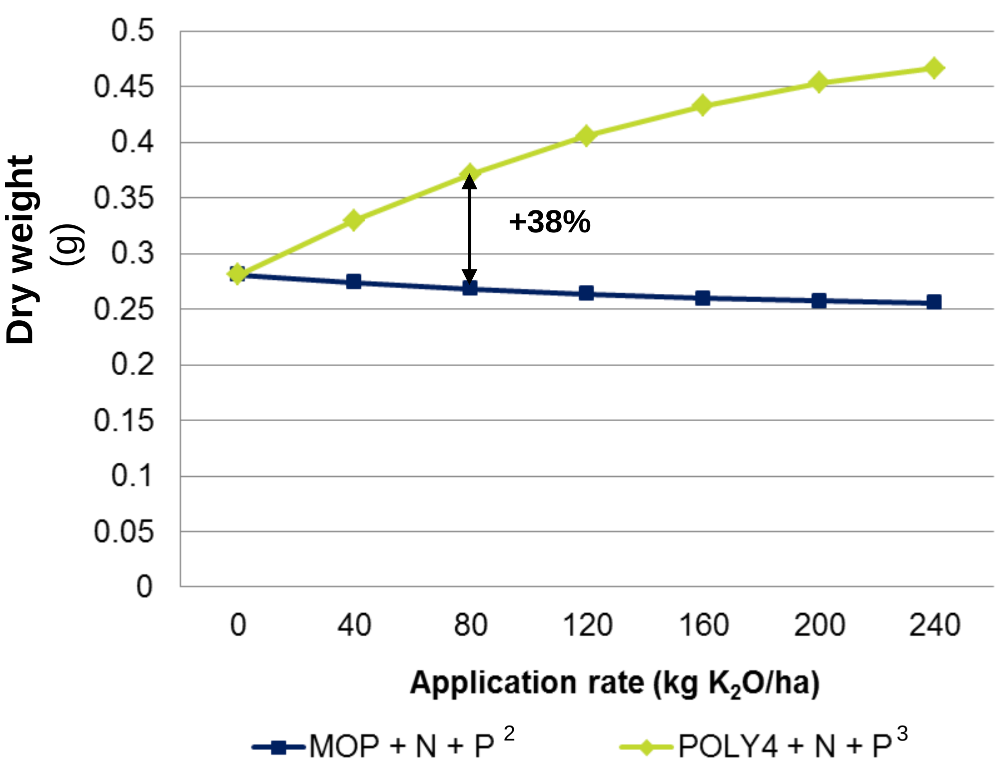
Wheat fertilized with POLY4 demonstrated significantly higher aerial dry weight than the sum of its parts

Notes: 1) Winter Wheat type Gallant; Regression curve of test results; Soil conditions: Nafferton clay loam; soil pH 6.3, P 9mg/L, K 82mg/L, Mg 203mg/L, S 134mg/L; Variance 61% accounted for; Control N as Urea 150 mg N/kg and P as calcium dihydrogen phosphate 37mg P/kg; 2) Synthetic polyhalite: replication of the polyhalite nutrient composition by mixing the sulphates of potash (SOP), calcium (CaO) and magnesium ($MgSO_4$) in the exact same amounts as in 100% pure natural polyhalite; 3) Polyhalite; Sources: Durham University

Wheat (Cordiale) pot study

POLY4 outperforms MOP as a result of additional nutrients

1 **Wheat (Cordiale) dry weight** [1]
(in grams)



2 **Key findings**

- Cordiale aerial dry weight is the preferred yield indicator for biomass
- POLY4 shows a significantly higher dry weight (38%) in comparison with the MOP at 80kg/ha K_2O
- POLY4 is outperforming MOP as a result of supplying the additional nutrients sulphur, magnesium and calcium and/or a lack of chlorides

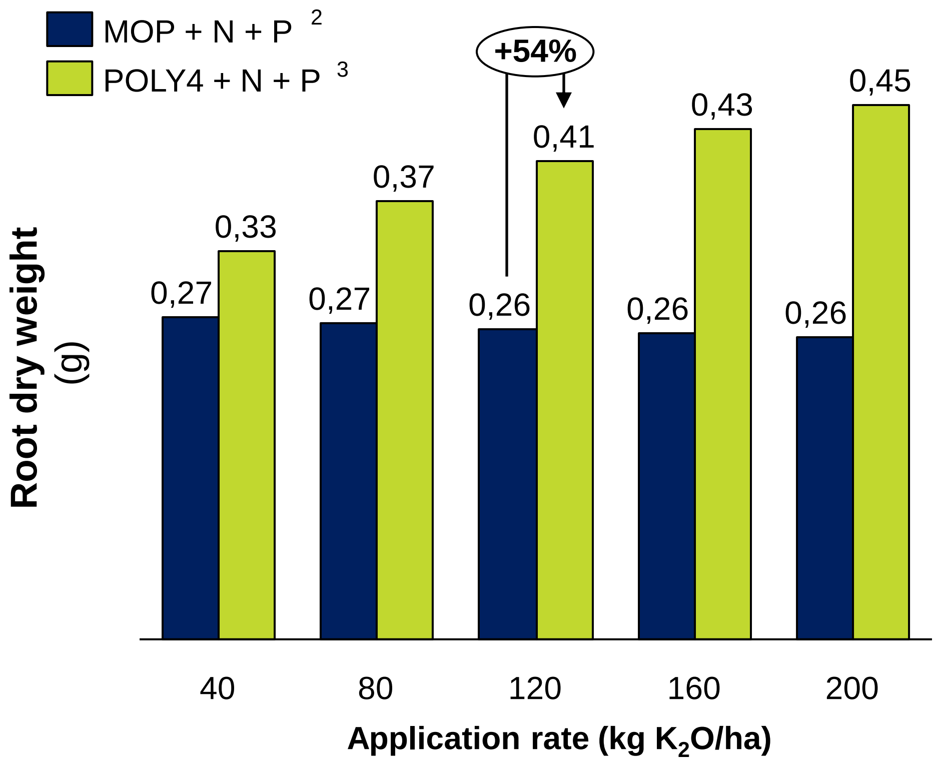
This trial demonstrated enhanced growth as a result of the additional nutrients supplied by POLY4

Notes: 1) Regression curve of test results; Winter Wheat type: Cordiale Aerial; Soil conditions: Nafferton clay loam soil pH 6.3, P 9mg/L, K 82mg/L, Mg 203mg/L, S 134mg/L; Variance 49% accounted for ; Control N as Urea 150 mg N/kg and P as calcium dihydrogen phosphate 37mg P/kg; 2) Muriate of Potash; 3) Polyhalite; Sources: Durham University

Wheat (Cordiale) pot study

Root dry weight is an important indicator of establishment

1 Wheat (Cordiale) Root dry weight [1]
(in grams)



2 Key findings

- POLY4 significantly outperformed MOP overall
- POLY4 outperformed MOP by 54% based on 120 K_2O kg/ha
- Quick establishment of the young root is essential for anchorage, nutrient and water resourcing by the plant
- Healthy, faster maturing roots minimise risk of seedling damping off

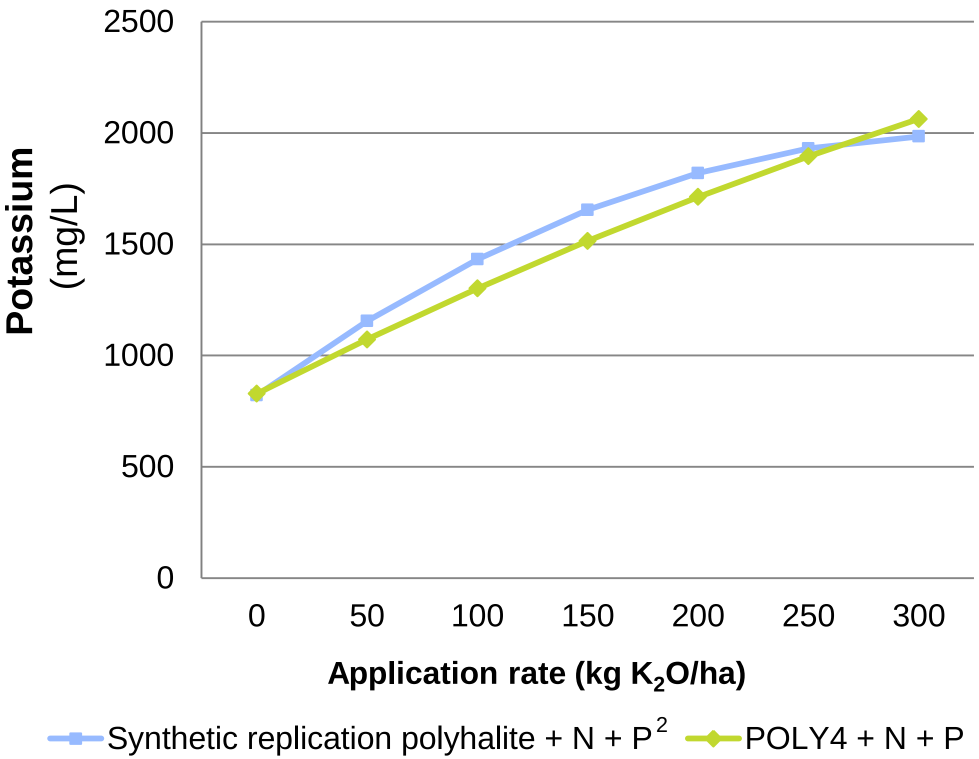
POLY4 outperformed MOP in terms of the cordiale root dry weight

Notes: 1) Actual mean test results; Winter Wheat type Cordiale Aerial; Soil conditions: Nafferton clay loam; soil pH 6.3, P 9mg/L, K 82mg/L, Mg 203mg/L, S 134mg/L; Control N as Urea 150 mg N/kg and P as calcium dihydrogen phosphate 37mg P/kg; 2) Muriate of Potash; 3) Polyhalite; Sources: Durham University

Oilseed rape (Canola) pot study

POLY4 potassium is available to the plants stem at all application rates

① Oilseed rape stem K [1]
(in K mg/L)



② Key findings

- K from POLY4 is available for the plant at low and high application rates
- Above 300kg K_2O/ha POLY4 uniquely continues to elevate tissue K
- This nutritionally balanced trial confirmed the availability of potassium to the plants at all application rates
- No significant differences were measured between the synthetic fertilizer and the granulated form of POLY4 over the 0-300 kg/ha K_2O application range

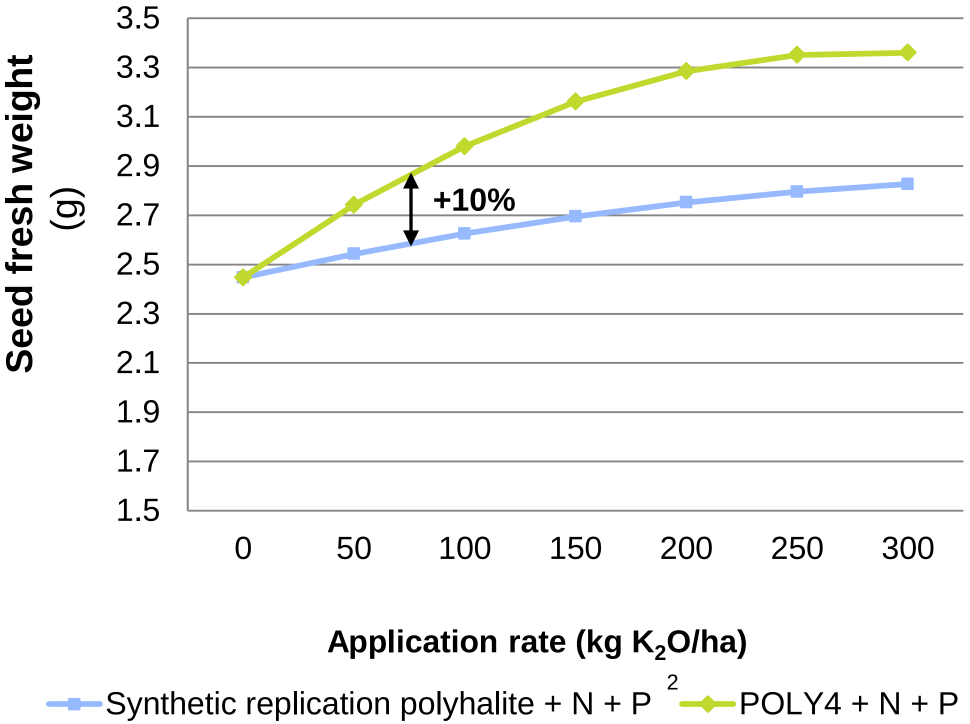
Pot study confirmed the availability of potassium for oilseed rape

Notes: 1) Regression curve of test results; Oilseed rape as known as Canola; Soil conditions: Nafferton clay loam soil pH 6.3, P 9mg/L, K 82mg/L, Mg 203mg/L, S 134mg/L ; Variance 65% accounted for; Control N as Urea 150 mg N/kg and P as calcium dihydrogen phosphate 37mg P/kg; 2) Synthetic polyhalite: replication of the polyhalite nutrient composition by mixing the sulphate of potash (SOP), calcium (CaO) and magnesium ($MgSO_4$) in the extract same amounts as in 100% pure natural polyhalite; 3) Polyhalite; Sources: Durham University

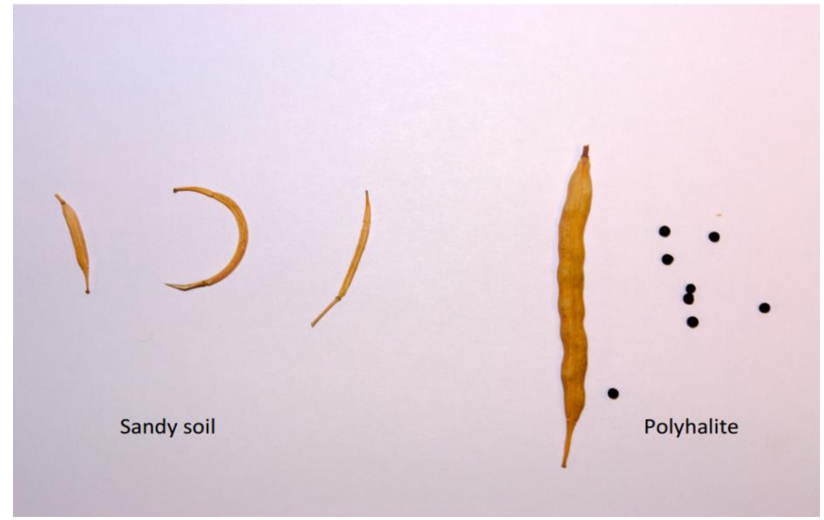
Oilseed rape (Canola) pot study

POLY4 outperformed the sum of its parts

1 Oilseed rape (Canola) seed fresh weight per plant [1]
(in grams/plant)



2 Picture rape seed pods
(Poor vs. Polyhalite fertilized soils)



Sandy soil Polyhalite

Study indicated that the natural form of POLY4 outperformed the individual soluble formulations in oilseed rape

Notes: 1) Regression curve of test results; Oilseed rape as known as Canola; Soil conditions: Nafferton clay loam; Soil pH 6.3, P 9mg/L, K 82mg/L, Mg 203mg/L, S 134mg/L; Control N as Urea 150 mg N/kg and P as calcium dihydrogen phosphate 37mg P/kg 2) Synthetic polyhalite: replication of the polyhalite nutrient composition by mixing the sulphates of potash (SOP), calcium (CaO) and magnesium ($MgSO_4$) in the extract same amounts as in 100% pure natural polyhalite; 3) Polyhalite; Sources: Durham University

Cotton pot study

POLY4 potassium is available to the plants stem at all application rates

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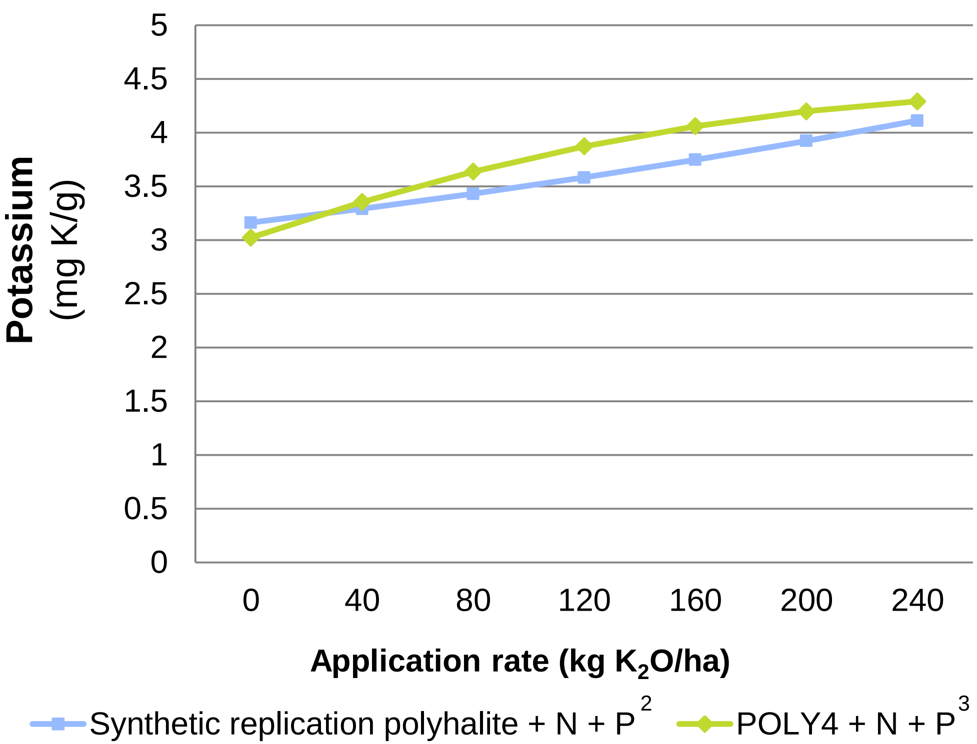
1 Cotton stem K fresh weight[1] (in mg K/g)



2 Key findings

- Pot study provides evidence that the POLY4 uptake increases with increased fertilizer application rate
- Granular POLY4 has no negative effect on the potassium uptake of the cotton plant
- Tissue [K] is important in defence against stem blight

Pot study confirmed the availability of potassium for cotton

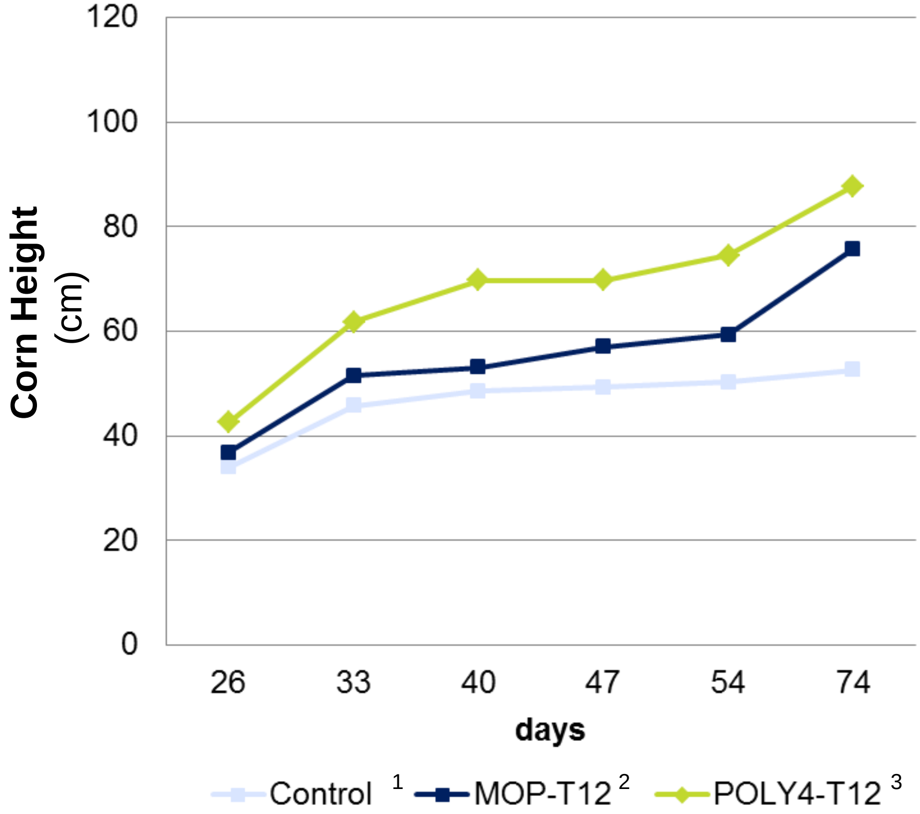
Notes: 1) Regression curve of test results; Soil conditions: Nafferton clay loam; Soil pH 6.3, P 9mg/L, K 82mg/L, Mg 203mg/L, S 134mg/L ; Variance 41% accounted for; Control N as Urea 150 mg N/kg and P as calcium dihydrogen phosphate 37mg P/kg; 2) Synthetic polyhalite: replication of the polyhalite nutrient composition by mixing the sulphate of potash (SOP), calcium (CaO) and magnesium ($MgSO_4$) in the extract same amounts as in 100% pure natural polyhalite; 3) Polyhalite; Sources: Durham University

Content

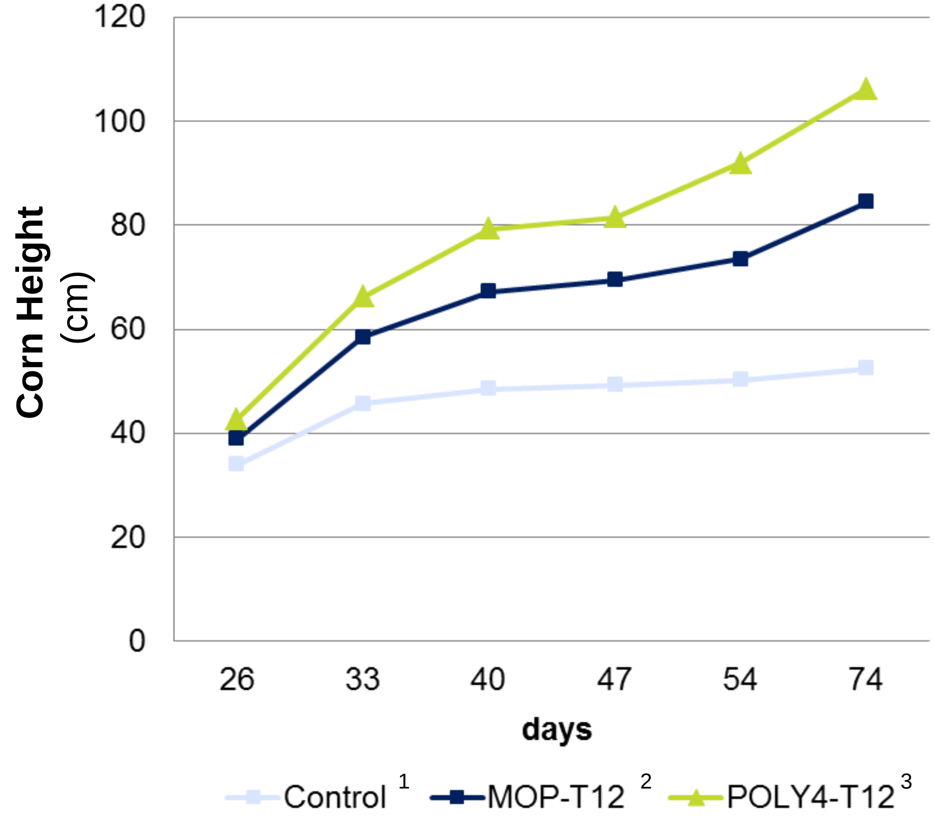
Corn growth pot study

POLY4 blends outperform MOP blends with regard to early growth results

1 **Corn height to last visible collar** (in cm, 50kg K_2O/ha)



2 **Corn height to last visible collar** (in cm, 100kg K_2O/ha)



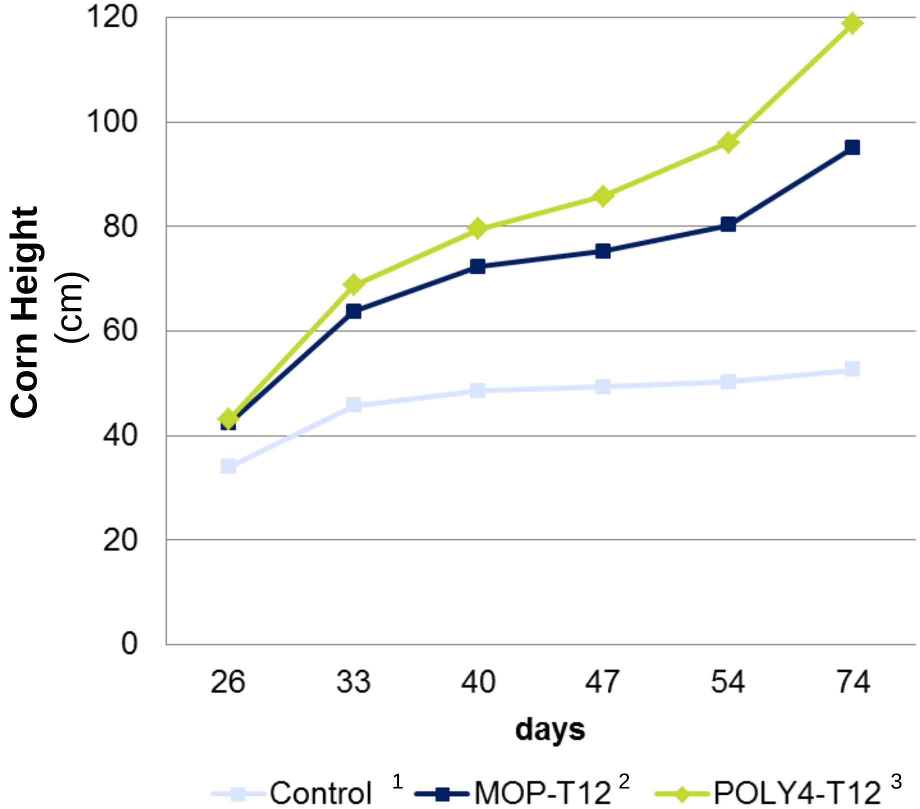
Early growth benefits of POLY4 blends are evident even at low fertilizer application rates

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, SO_4 2- 0.38g kg-1; 2) Control N as Urea and P as DAP 2) 1 kg MOP 12-12-12 NPK blend is 260.9 gr Urea, 260.9 gr TSP, 200 gr MOP; 5) 1 kg Polyhalite 12-12-12 NPK blend is 159.7 gr Urea, 272.2 gr MAP, 91.5 gr MOP, 440.1 gr Polyhalite
Source: Shandong Agricultural University

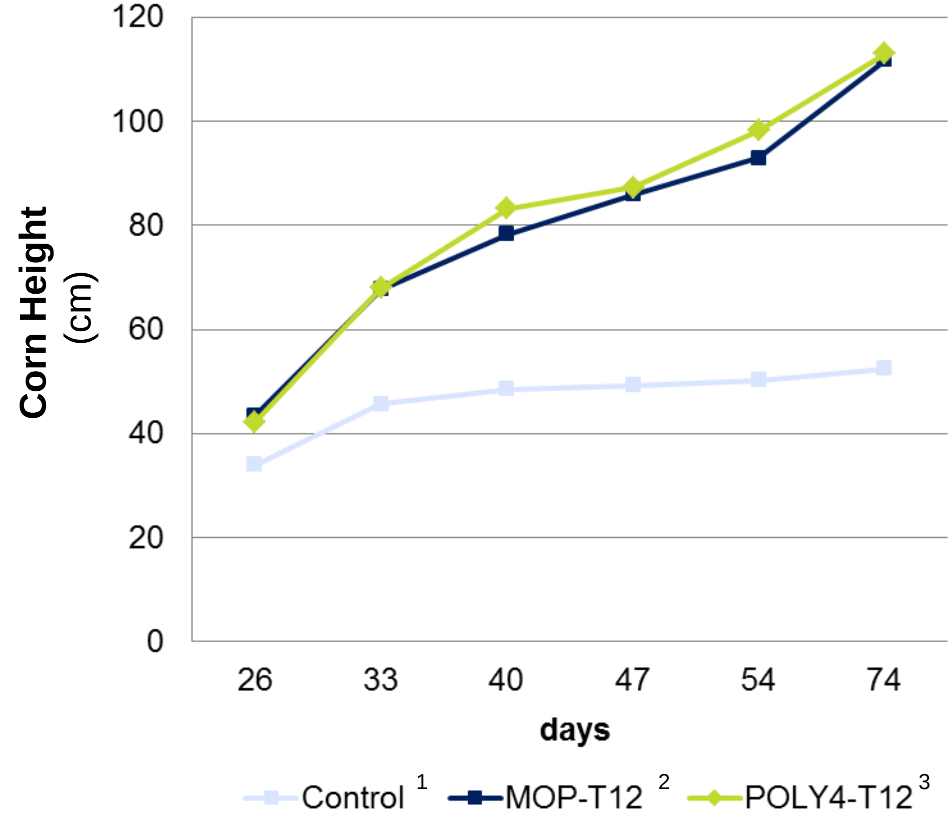
Corn growth pot study (Continued…)

POLY4 blends boost growth

Corn height to last visible collar
① (in cm, 200kg K_2O/ha)



Corn height to last visible collar
② (in cm, 300kg K_2O/ha)



High K rates from other sources are required to match the effects of POLY4

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, SO_4 2- 0.38g kg-1; 2) Control N as Urea and P as DAP 2) 1 kg MOP 12-12-12 NPK blend is 260.9 gr Urea, 260.9 gr TSP, 200 gr MOP; 5) 1 kg Polyhalite 12-12-12 NPK blend is 159.7 gr Urea, 272.2 gr MAP, 91.5 gr MOP, 440.1 gr Polyhalite
Source: Shandong Agricultural University

Corn leaf viability pot study

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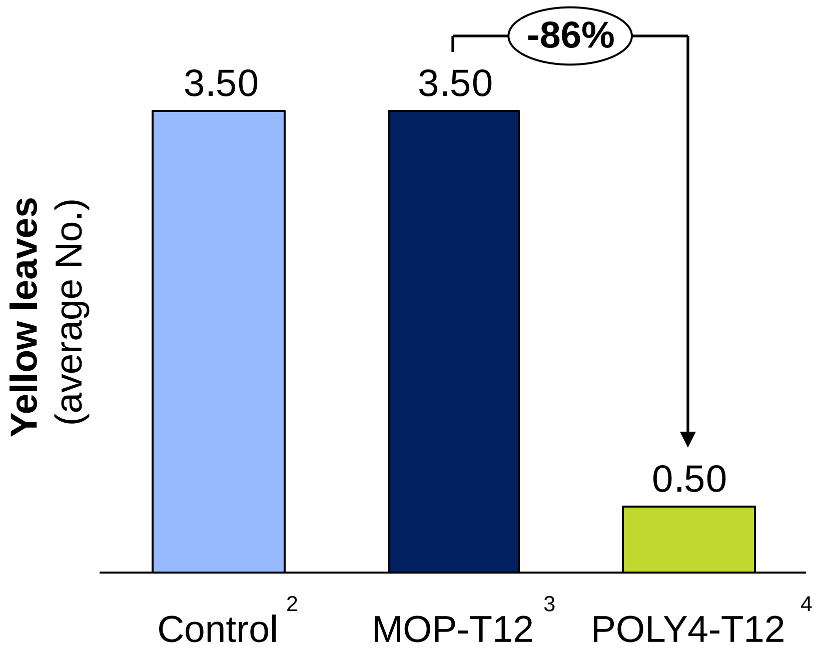
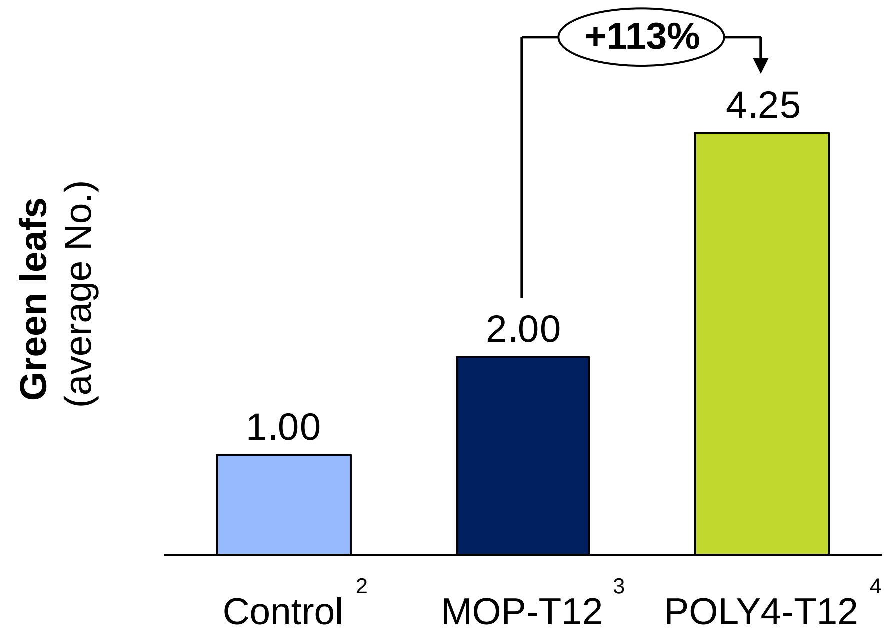
Multi-nutrient character of POLY4 improves green leaf area

1 Corn leaf senesce assessment [1]
(No. of yellow leafs, at 100kg K_2O/ha)



2 Corn viable leaf assessment [1]
(No. of green leafs, at 100kg K_2O/ha)



- Yellow leaves are an indication of poor crop health which could affect the corn's yield and quality
- POLY4 fertilized plants were significantly healthier and potentially more disease tolerant

POLY4 outperformed MOP as it maximises plant photosynthetic capacity by reducing green leaf losses

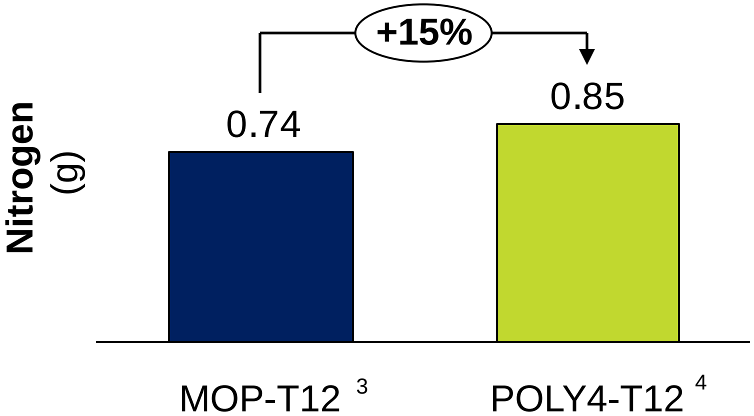
Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, SO_4 2- 0.38g kg-1; 2) Control N as Urea and P as DAP 2) 1 kg MOP 12-12-12 NPK blend is 260.9 gr Urea, 260.9 gr TSP, 200 gr MOP; 5) 1 kg Polyhalite 12-12-12 NPK blend is 159.7 gr Urea, 272.2 gr MAP, 91.5 gr MOP, 440.1 gr Polyhalite
Source: Shandong Agricultural University

Corn nutrient uptake pot study

POLY4 multi-nutrient character supported the crop N,P,K uptake

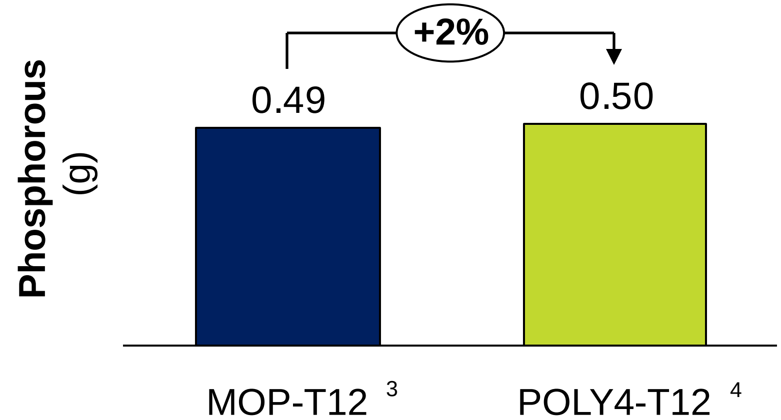
1 Corn N uptake tissue analyses [1, 2]

(gr/plant, based on 100kg K_2O/ha)



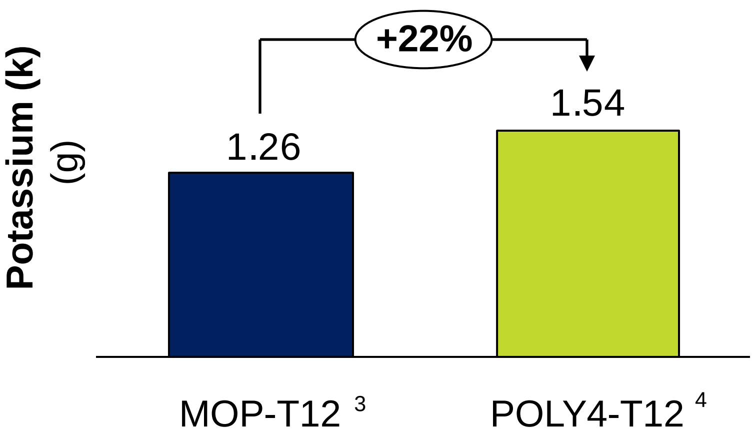
2 Corn P uptake tissue analyses [1, 2]

(gr/plant, based on 100kg K_2O/ha)



3 Corn K uptake tissue analyses [1, 2]

(gr/plant, based on 100kg K_2O/ha)



4 Key findings

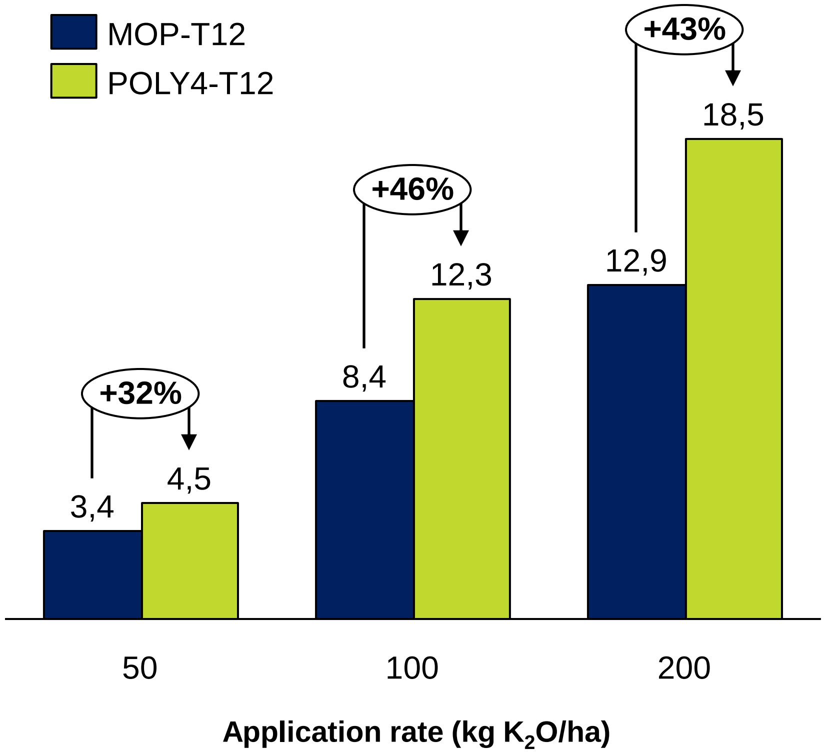
- POLY4 additional nutrients significantly outperformed the uptake of N in comparison with MOP
- Potassium uptake of corn by POLY4 blends significantly outperformed MOP blends

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, $SO_4$2- 0.38g kg-1; 2) Control N as Urea and P as DAP 2) 1 kg MOP 12-12-12 NPK blend is 260.9 gr Urea, 260.9 gr TSP, 200 gr MOP; 5) 1 kg Polyhalite 12-12-12 NPK blend is 159.7 gr Urea, 272.2 gr MAP, 91.5 gr MOP, 440.1 gr Polyhalite
Source: Shandong Agricultural University

Corn yield pot study

POLY4 significantly outperformed MOP on total grain weight

1 Corn total grain weight [1]
(in g)



2 Key findings

- POLY4 blends significantly enhanced the grain weight of corn compared to MOP blends
- Yield response is maintained across a range of POLY4 blends application rates
- Yield response 46% better for triple 12 blends made with POLY4 vs. traditional products at 100 kg K_2O/ha in this study

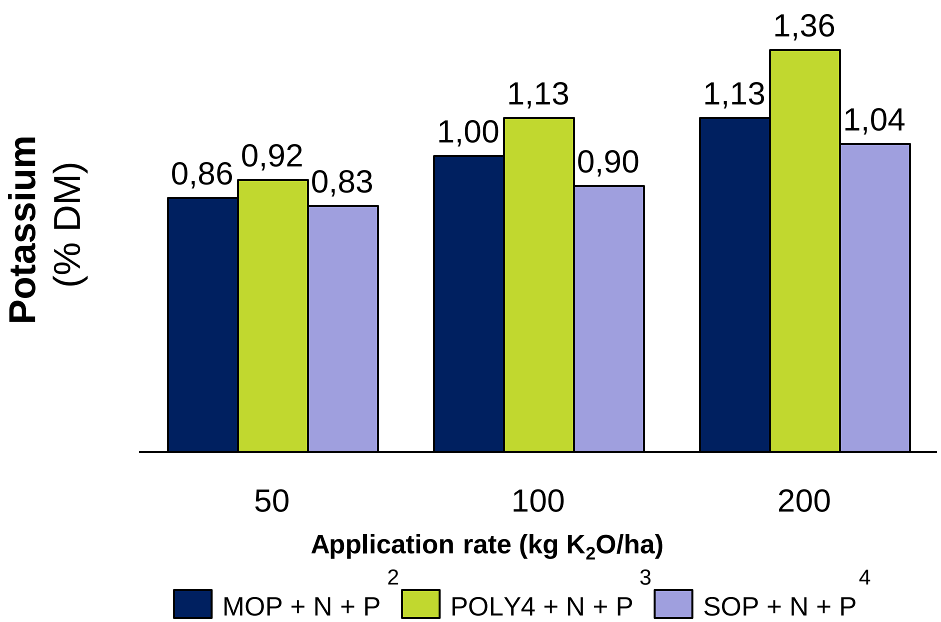
POLY4 blends outperformed MOP blend significantly regarding corn total grain weight

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, $SO_4$2- 0.38g kg-1; 2) Control N as Urea and P as DAP 2) 1 kg MOP 12-12-12 NPK blend is 260.9 gr Urea, 260.9 gr TSP, 200 gr MOP; 5) 1 kg Polyhalite 12-12-12 NPK blend is 159.7 gr Urea, 272.2 gr MAP, 91.5 gr MOP, 440.1 gr Polyhalite
Source: Shandong Agricultural University

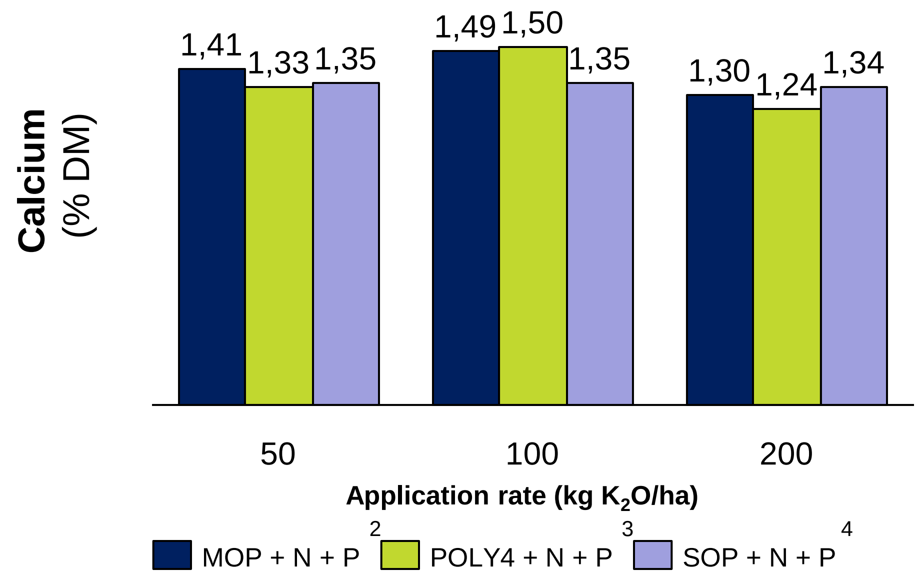
Peanut pot study

POLY4 is an effective source of potassium for peanuts

1 **Peanut tissue K** [1]
(K% in DM, 171d)



2 **Peanut tissue Ca** [1]
(Ca% in DM, 171d)



- POLY4 is an effective source of potassium and is significantly outperforming MOP and SOP at 200kg K_2O/ha
- Calcium nutrient is highly important for peanut cultivation due to tissue strength and plant defence [5]

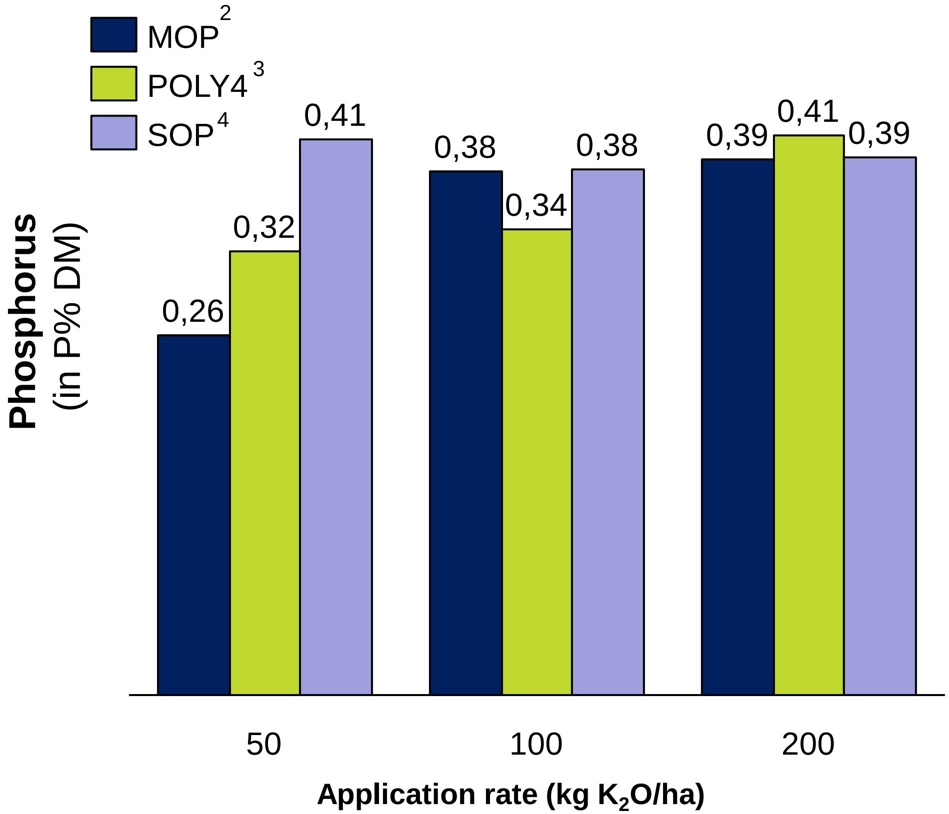
POLY 4 plant nutrition has plant quality and disease defence implications

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, SO_4 2- 0.38g kg-1; Control N as Urea and P as DAP 2) Muriate of potash; 3) Polyhalite; 4) Sulphate of Potash; 5) No significant difference between products or rates concerning calcium uptake Source: Shandong Agricultural University

Peanut pot study

POLY4 is a good fit for peanut production

1 **Peanut tissue P**
(P % DM, 171d)



2 **Key findings**

- High calcium availability as a result of fertilizing with POLY4 caused no adverse effect on P uptake compared to other K sources without Ca
- POLY4 proved to be a suitable commercial fertilizers for peanuts as no antagonistic response is measured with regards to the phosphorus uptake as a result of the calcium content of POLY4

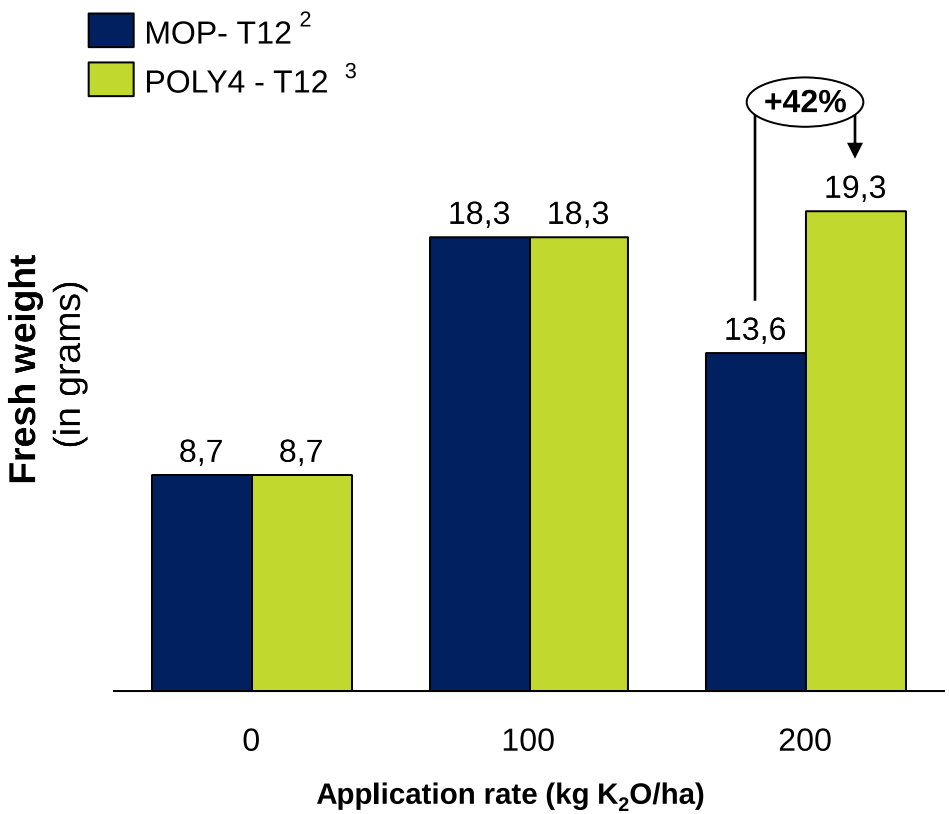
POLY4 proved to be a suitable commercial fertilizer for peanuts

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, $SO_4$2- 0.38g kg-1; Control N as Urea and P as DAP
2) Muriate of potash; 3) Polyhalite; 4) Sulphate of potash; Source: Shandong Agricultural University

Peanut biomass pot study

POLY4 blends outperformed MOP on high application rates

1 **Peanut plant biomass** (gr/plant)



2 **Key findings**

- Higher rates of POLY4 are safe for peanut production while higher rates of MOP reduced peanut yields in this study
- MOP at high rates of application may reduce peanut yields due to peanut susceptibility to high chloride rates
- Peanuts are known for being chloride sensitive and should therefore ideally be fertilized with chloride free fertilizers

POLY4 blends were shown to be an effective commercial fertilizer for peanuts

Notes: 1) Actual mean test results; Soil conditions: Sandy loam; Soil pH 7.02; Mehlich 3 extracted K 308.6mg kg-1, Ca 0.67 g kg-1, Mg 0.29 g kg-1, SO_4 2- 0.38g kg-1; 2) Control N as Urea and P as DAP 2) 1 kg MOP 12-12-12 NPK blend is 260.9 gr Urea, 260.9 gr TSP, 200 gr MOP; 5) 1 kg Polyhalite 12-12-12 NPK blend is 159.7 gr Urea, 272.2 gr MAP, 91.5 gr MOP, 440.1 gr Polyhalite
Source: Shandong Agricultural University

Initial results continue to show positive results for POLY4 as a straight and blended fertilizer

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Overall findings

- Preliminary results indicated that POLY4 performs equally to or better than MOP
- Balanced trial results further stressed the unique value of one natural occurring multi-nutrient ore POLY4 compared to the synthetic replacement
- POLY4 demonstrated to be an effective source of potassium for plants
- POLY4 nutrients was readily available for the plants and caused no interference with the uptake of nitrogen and phosphorus

Durham University

- POLY4 outperformed the aerial dry weight during young wheat growth in two varieties tested in comparison with MOP
- Higher tissue potassium was observed in oil seed rape

Shandong Agricultural University

- Corn accelerated early growth, supported by POLY4 blends, reduces risk of seedling disease
- Corn fertilized with POLY4 significantly outperformed on leaf health
- POLY4 supported significantly higher grain yield
- Peanut trials indicated that POLY4 does not affect the phosphorus uptake

Crop study highlights

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Preliminary results indicated that POLY4 performs equally to or better than MOP

Balanced trials underlined the unique value of POLY4 as one naturally occurring multi-nutrient mineral

Plant uptake of potassium from POLY4 was equal to or better than MOP

POLY4 enhanced early plant growth

Peanuts responded better to NPK blends made with POLY4 than blends made with MOP

Content

1. Need for Polyhalite

2. Global Research Programme

3. Crop Study Results
   a) Crop Study results Durham University
      i. Wheat
      ii. Oilseed Rape
      iii. Cotton
   b) Crop Study results Shandong Agricultural University
      i. Corn
      ii. Peanuts
   c) Conclusion

4. **POLY4 Product Characteristics**
   a) Solubility
   b) Nutrient Release
   c) pH Analysis
   d) Soil Conductivity
   e) Conclusion

Polyhalite technical characteristics studies

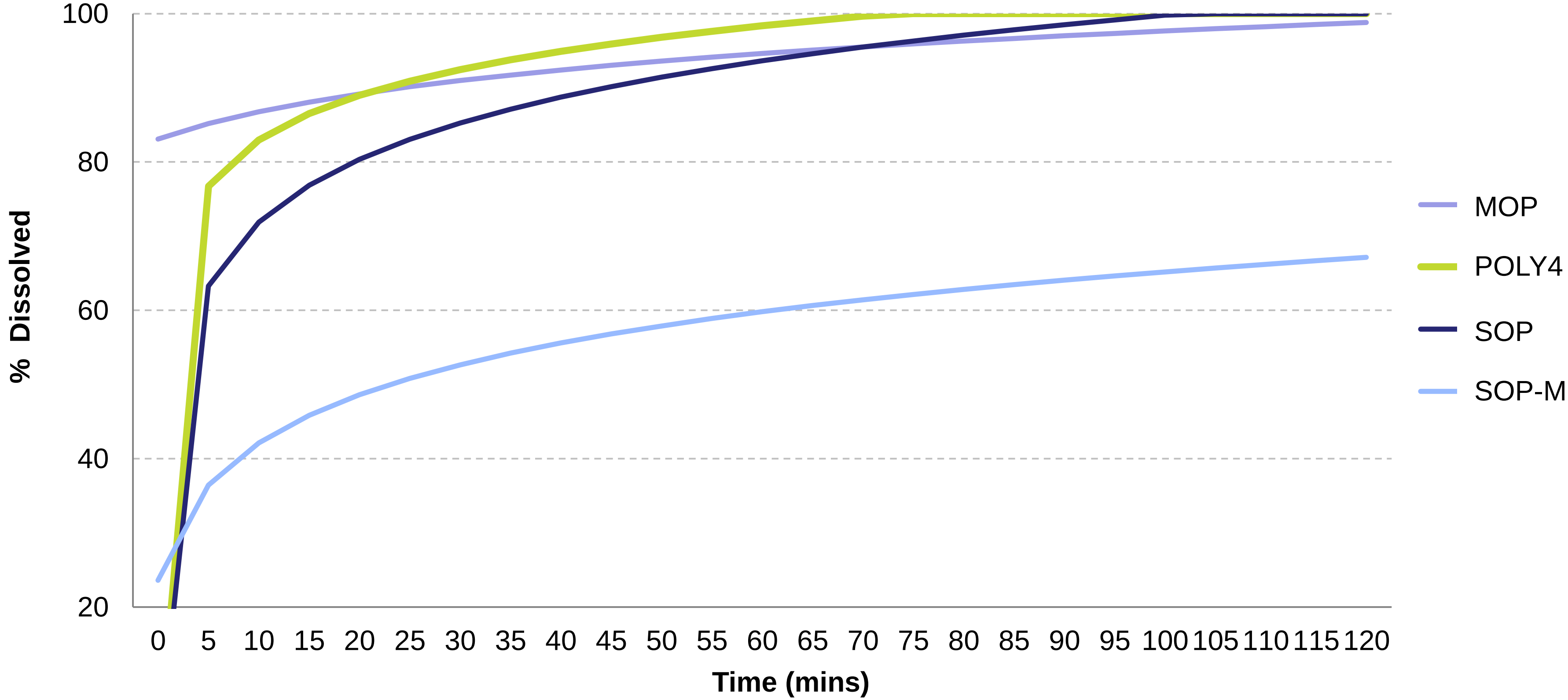
Conducted by well-known institutions and universities

University / Research Department	Study type	Type of method
Société Générale de Surveillance (‘SGS’)	▪ Solubility	▪ Laboratory testing to determine solubility as the maximum quantity of a fertilizer that can dissolve in a volume of water at a specific temperature measured in grams per litre
NRM Laboratories	▪ Nutrient release test	▪ Laboratory testing to determine how long it takes for individual polyhalite macro-nutrients to become available to the plants
Durham University	▪ pH analysis	▪ Soil acidity and alkalinity measured in pH levels (0–14)
University of Florida	▪ Soil conductivity ▪ Solubility ▪ Nutrient release test	▪ Electrical conductivity is the ability of a material to conduct (transmit) an electrical current which is commonly expressed in units of milliSiemens per metre (mS/m) ▪ Laboratory testing to determine the dissolution times of potash fertilizers ▪ Nutrient release data soil incubation test Mehlich III
Shandong Agricultural University	▪ Nutrient release test	▪ Nutrient release data soil incubation test Mehlich III

Potassium-based fertilizers solubility tests

Test results reveal that POLY4 is a soluble fertilizer

POLY4 solubility versus other potassium-based fertilizers [1]
(in %, Time in minutes)



Granular POLY4 dissolves in water much faster than SOP-M and as quickly as SOP

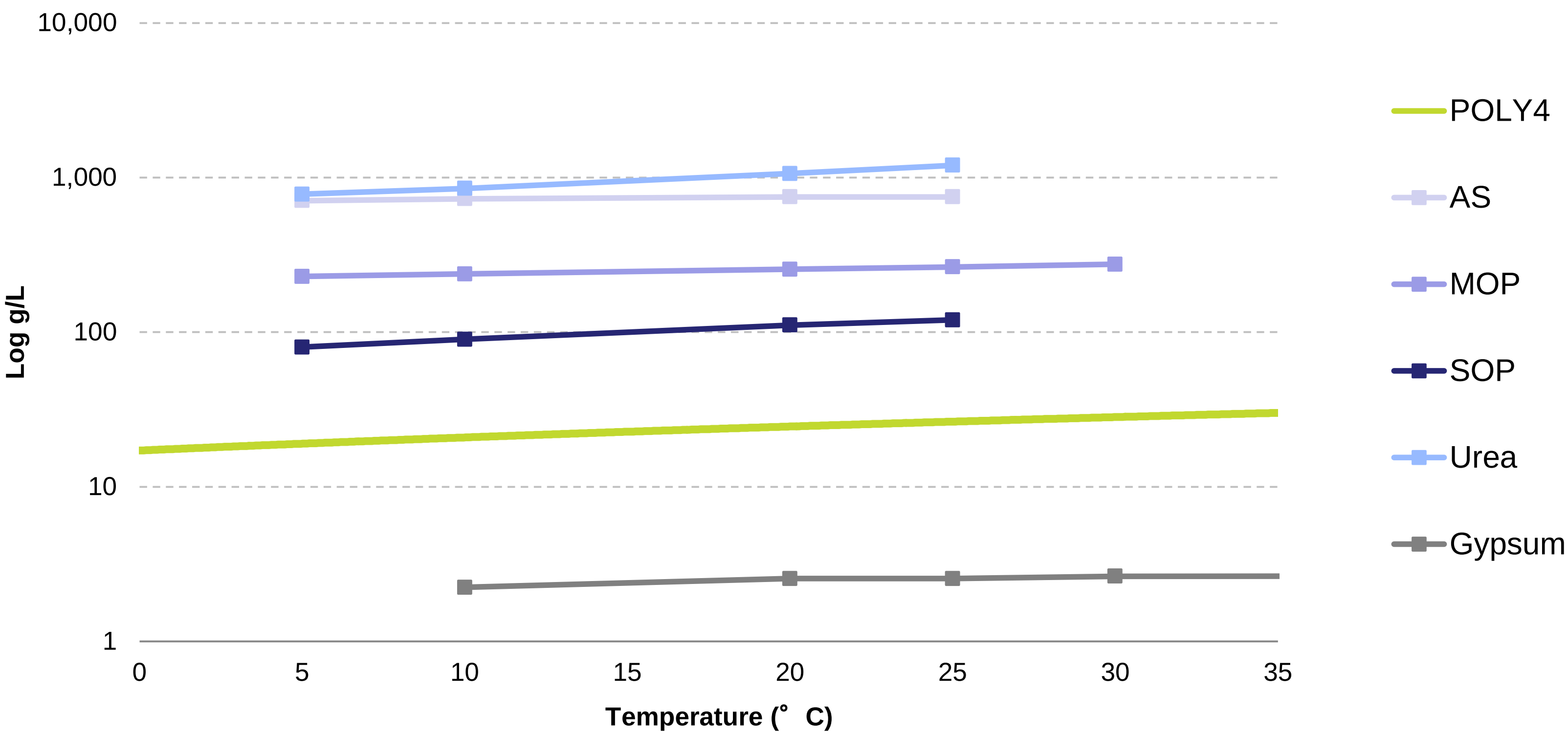
Notes: 1) Test was conducted by adding 1 gram of fertilizer to 100ml of deionised water, 20ºC with agitation
Sources: 1) University of Florida (2013)

Solubility test of selected commercial fertilizers

27.6g/L would be reached in the field with a POLY4 application of more than 10t/ha [2]

Solubility versus Temperature [1]

(in grams/L, Temperature in ° C)



	Solubility 25 ° C
POLY4	27.6 [1,5]
AS	750 [3]
MOP	264 [2]
SOP	120 [2]
Urea	1200 [4]
Gypsum	2.55 [4]

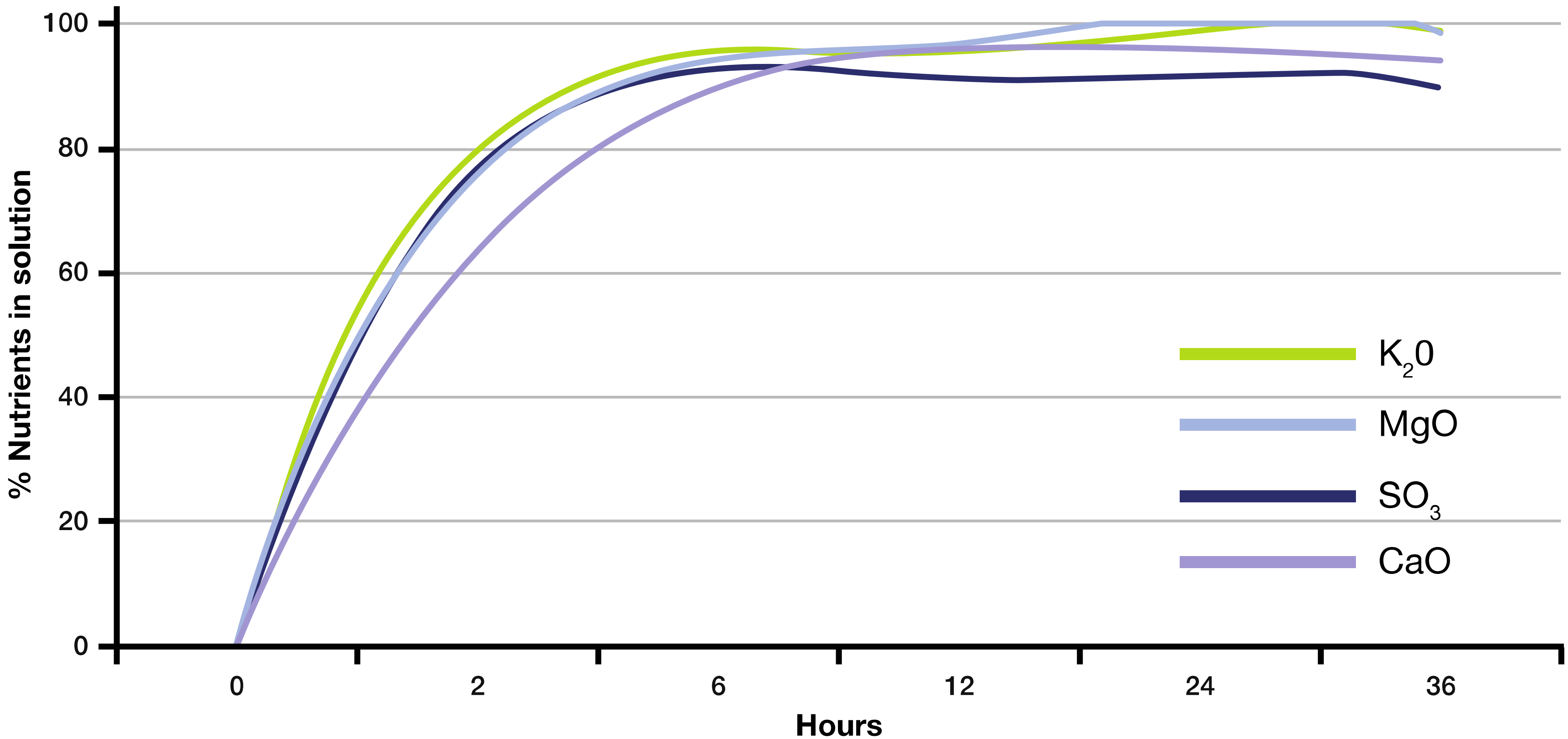
POLY4 is a soluble fertilizer for soil application use at all commercial application rates

Notes: 1) Calculations are based on medium loam with 400,000L/ha soil water at 25 ° C; 2) Under moist, medium textured soil conditions. Sources: 1) Societe Generale de Surveillance or 'SGS' (2013); 2) Elam, M., S. Ben-Ari, and H. Megan. 1995. The dissolution of different types of potassium fertilizers suitable for fertigation, 3) Sohnel, O. & Novotny, P., (1986), 4) IUPAC, 5) Handbook of Mineralogy 2005

Nutrient release

Nutrient release occurs as expected and is available for plant root uptake

POLY4 nutrient release [1]
(in %, Time in hours)



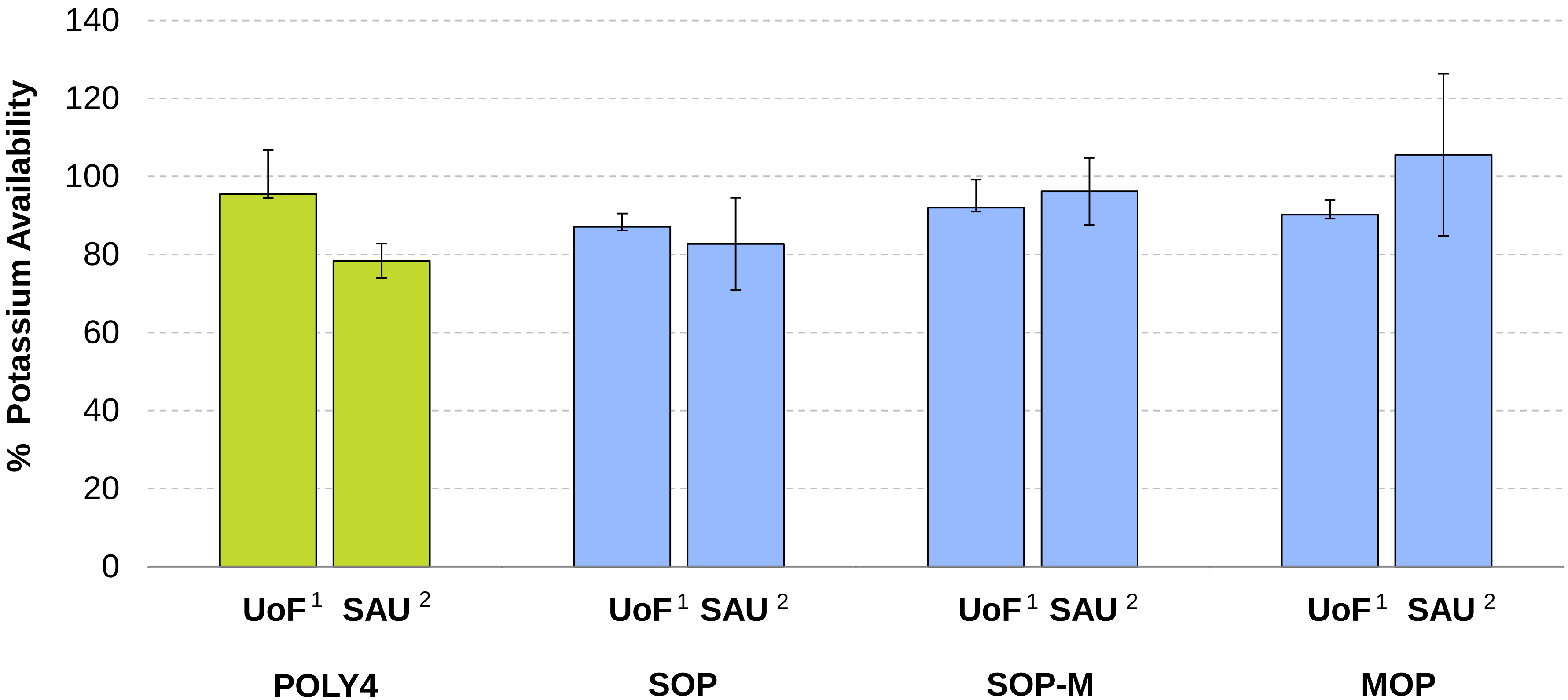
All POLY4 nutrients are released into soil solution

Notes: 1) Test conducted under the following conditions: Water temperature 20˚C
Sources: 1) NRM laboratories (2013)

Availability of potassium from K-based fertilizers

POLY4 potassium immediately available for plant uptake, similar to other K fertilizers

Available potassium (K) from potassium-based fertilizers after one day of incubation in soil [1]
(% of Amount Added in mean and Standard Deviation - Based on 1380 kg K_2O/ha)



POLY4's potassium is rapidly transferred to the soil's available nutrient pool

Notes: 1) Nutrient release of incubation in soil determined by Mehlich III extraction; 1) UoF: Wabasso sandy soil: pH = 4.8; K = 3 mg K/kg, Ca = 41 mg Ca/kg, Mg = 9 mg Mg/kg S = 28 mg S/kg
2) SAU; Sandy loam soil pH = 7.02; K = 308.6mg kg-1; Ca 0.67 g kg-1, Mg 0.29 g kg-1, SO_4- 0.38g kg-1, Particle compositions are 2-0.05 62.35 %, 0.05-0.002 36.13% and <0.002 1.52%.
Sources: 1) University of Florida (2013) ; 2) Shandong Agricultural University (2013)

Effect on soil pH

Soil pH is important for optimal plant growth

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pH analysis Soybean 30-days pot trials [1]

(soil pH scale 0-14 – Based on 345kg K_2O/ha)

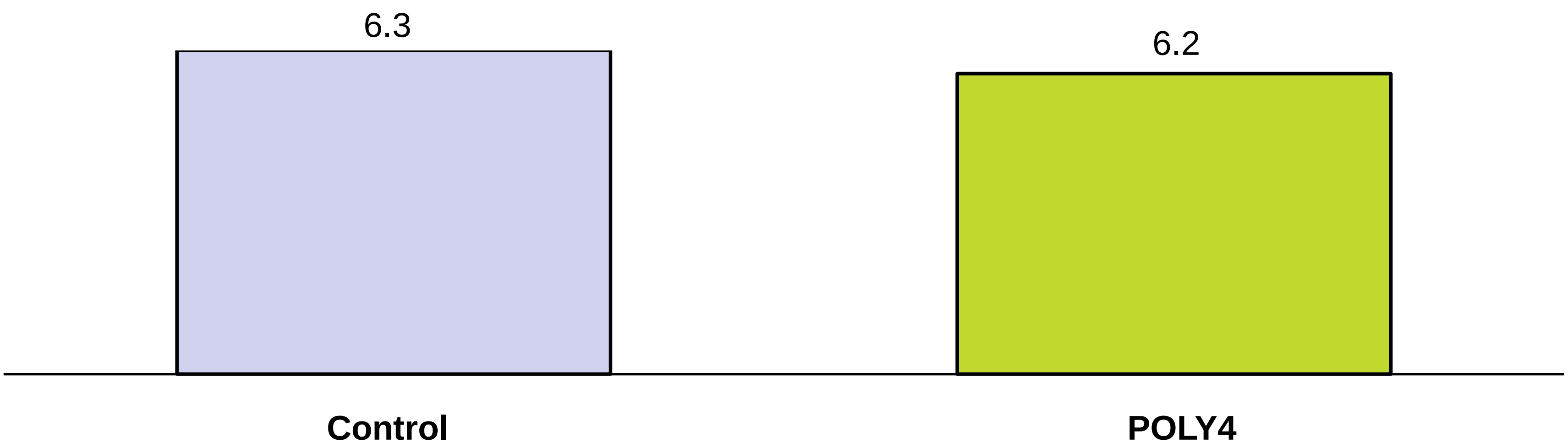
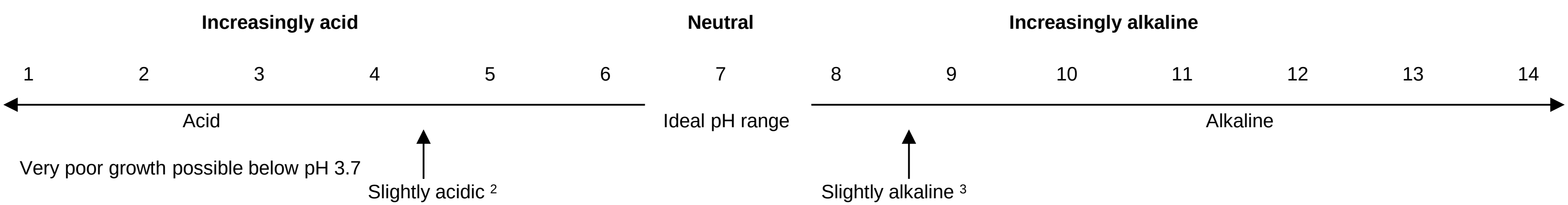


Figure 1: Plant growth and pH scale



POLY4 had no effect on soil pH levels

Notes: 1) Soil characteristics : Clay loam, Available nutrients P: 9; mg/L K; 82 mg/L; Mg: 205mg/L; CEC 14 meq/100g; 2) Slightly acid is increasingly too acid for sensitive plants; 3) Slightly alkaline increasing alkalinity leads to some plant nutrients becoming unavailable 4) All test soils had a full NPK fertiliser suite , comparison are between POLY4 and nil K soil is "NP Control"

Sources: Durham University

Influence of K-based fertilizers on soil conductivity

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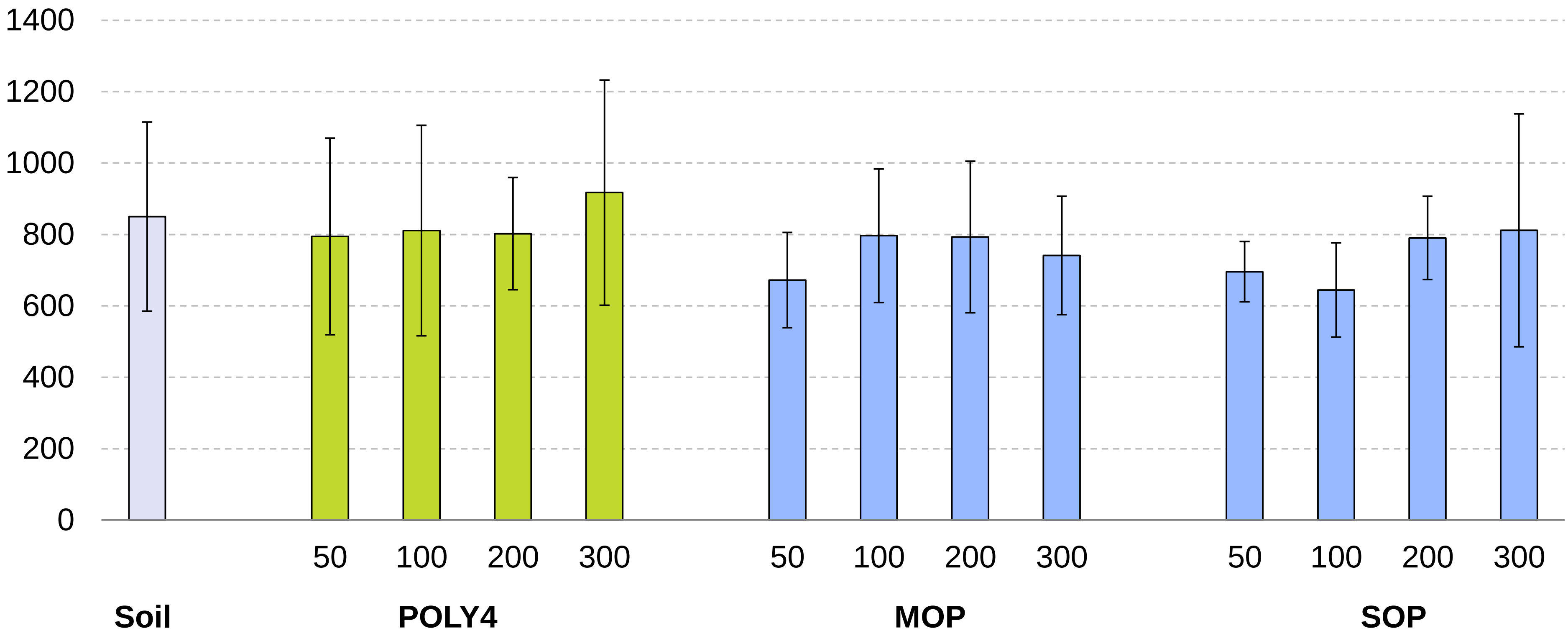
No significant effect on soil EC compared to that which did not receive application

Corn – 100 days Pot study trial [1]

(µS/cm in Mean and Standard Deviation, K_2O kg/ha)



In line with other potassium-based products, POLY4 has no effect on soil conductivity at commercial application rates

Notes: 1) Soil conductivity Corn analysis based on air dried soil sieve 2mm 10g with 40 ml deionised water, 30 minutes on an orbital shaker. Equilibrated 2 hours measured by Accumet ASR60 Multipara meter 2) Soil characteristics of Corn trial – Wabasso sandy soil: pH = 4.8; K = 3 mg K/kg, Ca = 41 mg Ca/kg, Mg = 9 mg Mg/kg S = 28 mg S/kg

Sources: University of Florida (2013)

Key takeaways

Polyhalite as the "Future of Fertilizer"

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Polyhalite product testing confirms its value as a suitable commercial fertilizer

POLY4 is a soluble fertilizer for soil application use at all commercial application rates

POLY4 had no significant effect on soil pH levels

POLY4 has no effect on soil conductivity

Thank You