

THE FUTURE OF FERTILIZER

Agronomy Update Summary February 2016

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BASIS CPD Points - see full slide decks for reference number

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Agronomy update summary





Sugarcane Results

- Field trial
- Nutrient response studies



Soybean Results

- Glasshouse and field studies
- Economic assessment



Tomato Bacterial Spot Results

- Glasshouse trial
- Product and rate response
 assessment



Main crops for Brazil states

Brazil commands globally significant production of key crops







Key findings

- Crops in Brazil were worth US\$128 billion in 2013, the 4th most valuable crop producer globally
- 768Mt of sugarcane, 82Mt of soybean and 4Mt of tomatoes were produced in Brazil in 2013
- 23 out of the 26 states grow soybeans, sugarcane or tomatoes
- The main challenge for Brazil is increasing yields in a sustainable manner
- Additional challenges are crop disease, improving soil nutrient status and input cost control
- Polyhalite is a registered fertilizer in Brazil in accordance with MAPA regulations Annex II

Brazil is a globally significant agricultural producer

Introduction to Brazilian sugarcane and soil

Brazil is a world leader for sugarcane production



Brazilian sugarcane



- 1.9 billion tonnes of sugarcane are produced globally, with 40% coming from Brazil, the world's largest producer¹
- 10.2 million ha in Brazil are used to produce sugarcane¹

Brazilian soils



- Soils are often weathered and low in nutrient capacity (Ferralsols), calcium and sulphur content
- Fertilizer, lime and gypsum are commonly applied on Brazilian soils
- An estimated 970Mt soil erosion losses cost Brazil US\$5.8 billion annually²

Brazil needs to use fertilizers and soil amendments to remain world leader of sugarcane production

POLY4 is a multi-nutrient fertilizer delivering agronomic and soil benefits

Sugarcane presentation summary

POLY4 improves sugarcane yield and soil nutrient status

Sugarcane key conclusions

- Brazilian soil is often weathered and low in nutrients requiring inputs of lime, gypsum and fertilizers
- POLY4 is similar to gypsum as it contains calcium and sulphur but also adds potassium and magnesium, supporting balanced fertilization
- A POLY4 fertilizer plan delivers an increased revenue from 100 kg/ha less total nutrients than the standard gypsum fertilizer plan
- Trials using less POLY4 by weight compared to gypsum, resulted in 9% more cane yield and a 10% sugar yield improvement translating into increased revenue
- Nutrient uptake for calcium and sulphur were improved by 5% and 28% respectively when substituting the POLY4 calcium for the calcium supplied from gypsum
- Post cropping it was found that POLY4 improved soil nutrient status of potassium, magnesium, calcium and sulphur by 37%, 54%, 23% and 24% respectively







Soybean production in Brazil

Brazil is a globally significant producer of soybeans





Soybean production in Brazil states¹

Key findings

- Soybean production is worth US\$38 billion to the Brazilian economy
- Brazil is the world's 2nd largest producer of soybeans after the US – accounting for 82Mt of soybean in 2013
- 15 out of the 26 states grow soybeans covering 27.9 million ha
- Achieving soybean expansion will require the use of fertilizer
- Only 30% of farmers are using fertilizer^{2,3}
- POLY4 fertilizer has been shown to be effective for soybeans

The Brazilian soybean industry requires fertilizer to meet growing demand

Soybean presentation summary

POLY4 works in blends delivering improved performance

Soybean key conclusions

- SSP in blends was substituted with POLY4 plus TSP, and the K nutrient content then balanced
- In glasshouse trials, POLY4 blends were shown to improve above ground biomass due to POLY4's magnesium and micro-nutrients
- Glasshouse trials using POLY4 show increased sulphur uptake (127% in sand, 12% in soil) that is supportive of nitrogen fixation, leading to improved nitrogen uptake (68% in sand, 29% in soil)
- In field trials using POLY4, pre-planting with a 2:28:6 starter blend, there was improved soil nutrient status of potassium, calcium, magnesium and sulphur post cropping
- Using POLY4 pre-planting and in a blend offers flexibility to lower the required K₂O application whilst maintaining yields and delivering a saving of US\$27/ha
- In 0:14:14 blends, POLY4 enhances the nutrient content by adding magnesium, which is essential to soybean production
- Using POLY4 0:14:14 blends offers equivalent crop results to an MOP 0:14:14 whilst providing a saving of US\$31/t

Blends containing POLY4 deliver balanced, efficient nutrient plans important for soybean crops







Distribution of tomato bacterial spot

Bacterial spot is a global problem affecting yields

Bacterial spot distribution in the Americas¹



Top 10 global producer

bacterial spot present

Other global producers with

with bacterial spot

Tomato production in Brazilian states²





Key findings

- Global tomato market is worth US\$96.3 billion³
- The Americas produce 15% of the world's tomato crop³
- 4.2Mt were produced in Brazil (2013) on 62,700 ha with current value of US\$5.8 billion
- Bacterial spot presents a challenge for six of the top ten producers in the world¹
- Crop losses from bacterial spot can be as high as 50%⁴ leading to loss of yields and growers' margins

POLY4 could address bacterial spot across the Americas

Tomato bacterial spot presentation summary

POLY4 maintains plant health and combats bacterial spot

Main findings

- Tomato bacterial spot, caused by Xanthomonas species, leads to plant damage and yield losses
- Conventional management requires constant spraying of pesticides at an estimated \$217/ha investment¹
- Previous trials² have shown POLY4 to lower bacterial spot infection rate
- Further trials confirm POLY4 to be the best potassium fertilizer for lowering bacterial spot
- Rates above 150 kg K₂O/ha of POLY4 gives practical protection from infection
- Leaf infection rate, leaf volume, leaf fresh weight, plant height, plant and root biomass all benefit from POLY4 crop nutrition
- The POLY4 option improves the environmental and pesticide residue profile of the crop

The multi-nutrient characteristics of POLY4 provide significant protection against bacterial spot in tomatoes











Thank you