

Growing Coffee with POLY4 in Brazil & Colombia

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Introduction

Brazil is the biggest coffee producer globally whilst Colombia ranks third. Crop nutrition is conventionally provided to coffee from a range of products, with K being supplied as KCI (MOP), K_2SO_4 (SOP), or KNO₃. Magnesium (Mg) deficiency is common in the main coffee producing areas, which demands the use of Mg sources. Mg is supplied as MgO or MgSO₄, and Ca as calcium ammonium nitrate (CAN) or as $CaSO_{4}$ (gypsum).

Results

Brazil

These nutrients can also be supplied from POLY4, which provides low-chloride potassium, magnesium, sulphate-sulphur and calcium. The use of POLY4 can simplify the fertilizer programme and provide plant available nutrients throughout the growing season.

The objective of these trials was to test the response of coffee yield to POLY4 programmes compared to standard fertilizer programmes. Trials were conducted between 2016 and 2020 at two locations in Colombia and at three locations in Minas Gerais, the largest coffee producing state of Brazil.

Trial locations and treatments

Brazil

Three two-year long trials in Minas Gerais (six harvests), the largest coffee production state in Brazil, from 2016 – 2019.

Both treatments received N, P & K applications at recommended rates.

The POLY4 programme received 546 kg POLY4 ha⁻¹ which supplies 76 kg K₂O ha⁻¹, 104 kg S ha⁻¹, 33 kg MgO ha⁻¹, and 93 kg CaO ha⁻¹. Potassium was balanced with MOP.

Treatment	K ₂ O	S	MgO	CaO
Standard programme	230	0	0	0

The POLY4 programme increased coffee yield over standard NPK practices in five out of six harvests outperforming it by 2.8 bags ha^{-1} (168 kg ha^{-1}).

In addition, POLY4 improved leaf Mg by 5.5% helping to improve coffee productivity and maintain the coffee cup quality.



Colombia

The POLY4 programme increased coffee yield over standard NPK in five out of seven harvests, by a median 3.3 bags ha^{-1} (198 kg ha^{-1}).

POLY4 also increased yield compared to MOP+MgO+Gypsum, in five out of seven harvests, by a median 3.25 bags (195 kg ha⁻¹). In addition, POLY4 improved leaf K by 1.4kg⁻¹ helping to meet the crop's large demand for K.

POLY4 programme	230
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104

93

33

Colombia

One, three-year trial in Cauca and a separate four-year trial in Caldas from 2016 – 2020 (seven harvests).

Crops received MOP, MOP+MgO+Gypsum, or a mixture of POLY4 and MOP 260 kg N ha⁻¹ and 42 kg P_2O_5 ha⁻¹ were supplied from Urea and DAP.

All fertilizer applications were evenly split twice per year during the rainfall season onto the soil.

POLY4 application rate was 663 kg POLY4 ha⁻¹ which supplies 93 kg K₂O ha⁻¹, 126 kg S ha⁻¹, 40 kg MgO ha⁻¹, and 113 kg CaO ha⁻¹. Potassium was balanced among treatments with MOP.

Treatment	K ₂ O	S	MgO	CaO
MOP	260	0	0	0
MOP + MgO + Gypsum	260	80	40	113
POLY4 programme	260	126	40	113



Conclusion

The results demonstrate that POLY4 offers the benefits of a balanced, season-long crop nutrition helping to increase yield potential.

Yield was improved in both countries, consistently across a number of locations and years. Overall, yield was improved in ten out of thirteen harvests compared to MOP and five out of seven harvests compared to MOP+MgO+Gypsum

Pre-trial soil analysis

Variable	Brazil: Rainfed site	Brazil: irrigated site	Colombia: Cauca	Colombia: Caldas
SOM (%)	3.3	2.1	21.3	8.7
K (mg L ⁻¹)	189	163	156	78
P (mg L ⁻¹)	6	2	64	24
S (mg L ⁻¹)	14	13	_	27
Ca (mg L ⁻¹)	600	400	100	238
Mg (mg L ⁻¹)	132	84	48	37
pH (CaCl ₂)	5.3	5.1	<5	5.2
pH (Water)	6	6		

All our trial information

is available to view online and download via the QR code:



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