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# EVALUATION OF POLYHALITE AS A FERTILIZER INFLUENCING YIELD AND SANITY IN POTATO CROP

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## INTRODUCTION

Potato cultivation is generally carried out on soils with high fertility, overcorrection and overfertilization; so low response to fertilizer use is expected. Soils usually have high amounts of chloride and sodium, and the use of less saline sources may be an alternative to higher yields and also to quality.

Polyhalite is a natural fertilizer that contains 14% K<sub>2</sub>O, 12% Ca, 3.6% Mg, 19.2% S, has low salt content and is compatible for blending with other fertilizers.

## OBJECTIVES

Evaluate the effect of MOP fertilizer replacement by Polyhalite, as well as to evaluate the effect of calcium supply on the incidence of blackleg of potato (*Pectobacterium carotovorum*).

## MATERIAL AND METHODS

**Location:** Piedade, SP, Brazil

**Soil:** clay with high fertility, 659 g kg<sup>-1</sup> of clay, 206 g kg<sup>-1</sup> of sand, 141 g kg<sup>-1</sup> of silt. Chemical analysis in the 0-20 cm layer is presented below in Table 1.

**Table 1.** Chemical properties of the soil before application

O.M.	pH	P <sub>Resin</sub>	K	Ca	Mg	Al	H+Al	SB	CTC	V%	S	B	Cu	Fe	Mn	Zn
g dm <sup>-3</sup>	CaCl <sub>2</sub>	mg dm <sup>-3</sup>				mmol <sub>c</sub> dm <sup>-3</sup>				%			mg dm <sup>-3</sup>			
27	5,5	148	4,2	62	13	0	22	79,5	101,5	78	16	1,6	3,3	57	4,2	5,5

OM (sodium dichromate 4N and H<sub>2</sub>SO<sub>4</sub> 10N); P, K, Ca, Mg (Resin); Al (KCl); H+Al (SMP); S (calcium phosphate); B (hot water); Cu, Fe, Mn and Zn (DTPA).

**Statistical Design:** randomized blocks, with 8 treatments and 4 blocks.

**Treatments:** blends of MOP and Polyhalite, relative to the weight of the fertilizers, to provide a rate of 320 kg ha<sup>-1</sup> K<sub>2</sub>O. Treatments 7 and 8 received all the potassium through MOP and had part of the phosphorus supplied by simple superphosphate (SSP) with the objective of applying 50% and 100%, respectively, of the rates of Ca supplied by Polyhalite in treatments 4 (50% of Polyhalite) and 6 (100% Polyhalite).

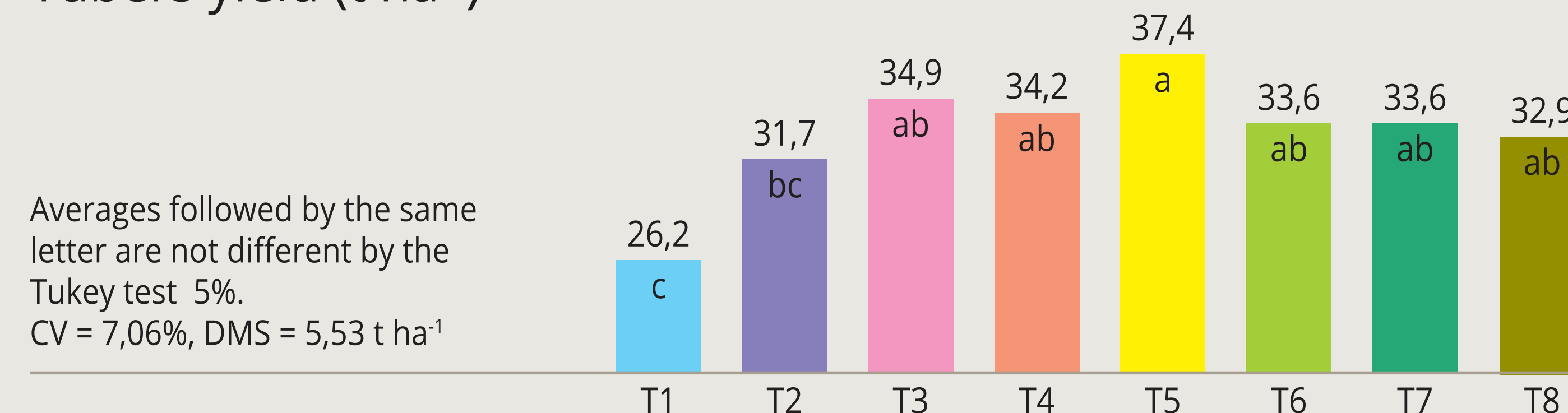
T1	Control
T2	100% MOP
T3	75% MOP / 25% Polyhalite
T4	50% MOP / 50% Polyhalite
T5	25% MOP / 75% Polyhalite
T6	100% Polyhalite
T7	100% MOP + SSP (52 kg / ha of Ca)
T8	100% MOP + SSP (274 kg / ha of Ca)

Planting in December / 2017 and harvest in March / 2018. At planting, 500 kg ha of P<sub>2</sub>O<sub>5</sub> was applied using MAP, and in treatments 7 and 8 the MAP rate was reduced as a function of the SSP supply. 220 kg ha<sup>-1</sup> of N were also applied using urea.

**Evaluations:** tubers yield; Incidence of blackleg of potato.

## RESULTS AND DISCUSSION

Tubers yield (t ha<sup>-1</sup>)



Blackleg of potato - number of stems per plot



The application of potassium was significant in relation to yield. There was greater effect due to the partial substitution of MOP by Polyhalite, and the best results were when 75% of MOP was replaced by the less saline source and with more nutrients, indicating the effect of better nutritional balance.

The replacement of MOP by Polyhalite led to a reduction in the number of stems attacked by the bacteria that caused blackleg.

## CONCLUSIONS

The use of Polyhalite is a viable alternative for potato fertilization cultivated in high fertility soils, once improves nutritional balance, decreases salinity, and increases sanity potential.

## ACKNOWLEDGMENTS