



Productivity of Sugarcane with Thermopotash (FIRST HARVEST)

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Introduction

Verdete is a silicate rock rich in glauconite and its K₂O percentage is between 7 and 11%. Mixing Verdete with CaCO₃ and heating to 1100 °C produces the thermopotash, an insoluble source of potassium in water. This study evaluated the effect of thermopotash in sugarcane production.

Materials and methods

An experiment with cultivar SP832847, was installed in June 2011 in Energy Cia Vale do São Lourenço, Minas Gerais, Brazil. The soil was classified as Rhodic Acrustox, with the following characteristics: pH 4.4; 15 mg dm⁻³ K; ECC 3.4 mmol_c dm⁻³. The experimental design was a randomized block in 2x5 a factorial arrangement Two sources of potassium were potassium chloride with 60% K₂O, and thermopotash with, 7.0% K₂O, 28.4% Si, 31% CaO and 6.9% MgO. Potassium doses were: 0, 100, 150, 200 and 250 kg ha⁻¹, totaling 10 treatments with 5 replications. Each plot was five 20-m long rows spaced at 1.5 m, with a total area of 150 m². In sugarcane planting 250 kg.ha⁻¹ of monoammonium phosphate was applied along with treatments at the bottom of the furrow. One year after planting sugarcane harvest and productivity was determined.

Results

Table 01. Effect of doses and sources of potassium, applied at planting, on the productivity of the stalks of sugarcane.

Doses K ₂ O Cane-plant kg.ha ⁻¹	1° harvest crop		
	TK	KCl	Average
0	113,0	113,6	113,3
50	135,7	122,8	129,3
100	136,1	132,5	134,3
150	123,4	128,8	126,1
200	134,8	120,8	127,8
Average	128,6 A	123,7 A	

CV= 10,57%; DMS source= 7,65.

Means followed by different letters in the line differ by Tukey test at 0.05% level of significance. TK = thermopotash; KCl = potassium chloride.

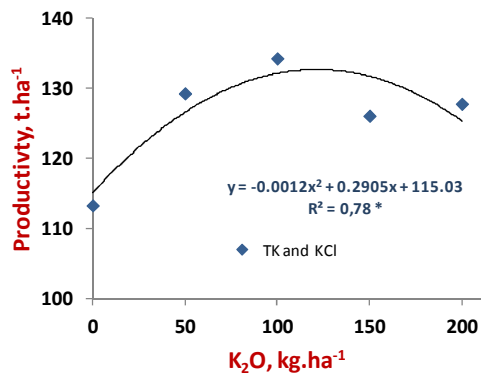


Figure 01. Effect of doses and sources of potassium, applied at planting, on the productivity of the stalks of sugarcane, variety SP832847 (Usina Vale do São Simão, Chaveslândia - MG).

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Table 02. Effect of doses and sources of potassium, applied at planting sugarcane, on the leaf content of K.

Doses K ₂ O Cane-plant kg.ha ⁻¹	1° harvest		
	Termo-K	KCl	Average
0	14,9 A	14,7 A	14,8
50	15,1 A	15,2 A	15,2
100	14,0 B	15,5 A	14,7
150	14,0 B	16,6 A	15,3
200	14,7 B	17,0 A	15,8
Average	14,5	15,8	

CV= 5,15 %; DMS source= 1,0

Means followed by different letters in the line differ by Tukey test at 0.05% level of significance. TK = thermopotash; KCl = potassium chloride.

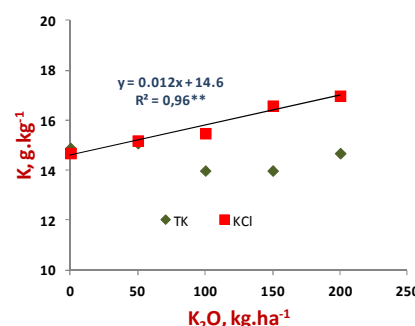


Figure 02. Effect of doses and sources of potassium, applied at planting, on the leaf content of K.

Table 03. Effect of doses and sources of potassium, applied at planting sugarcane, on the soil content of K in the 0-20 and 20-40 cm layer, after harvest of cane.

Doses K ₂ O Cane-plant kg.ha ⁻¹	Depth de 0-20 cm			Depth de 20-40 cm		
	Termo-K	KCl	Average	Termo-K	KCl	Average
0	0,05 A	0,05 A	0,05	0,03 A	0,05 A	0,03
50	0,07 A	0,08 A	0,08	0,05 A	0,04 A	0,05
100	0,18 A	0,07 B	0,13	0,10 A	0,04 A	0,04
150	0,25 A	0,06 B	0,16	0,22 A	0,04 B	0,13
200	0,28 A	0,07 B	0,18	0,30 A	0,05 B	0,18
Average	0,17	0,07		0,13	0,04	

CV= 15,77 %; DMS source=0,80 CV= 44,96 %, DMS source= 0,02

Means followed by different letters in the line differ by Tukey test at 0.05% level of significance. TK = thermopotash; KCl = potassium chloride.

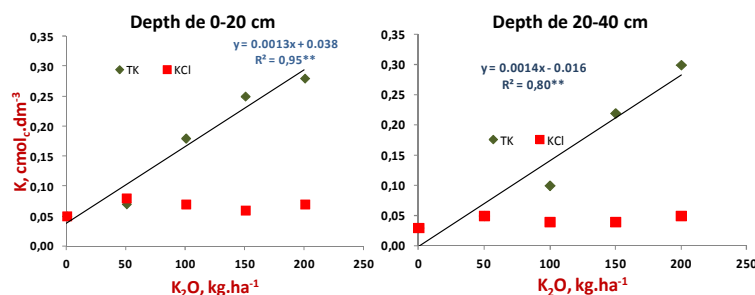


Figure 03. Effect of doses and sources of potassium, applied at planting, on the soil content of K in the 0-20 and 20-40 cm layer, after 1st harvest of cane.

Conclusion

The thermopotash can be used as potassium source for sugarcane. The maximum yield was 132.61 t ha⁻¹ in sugarcane obtained with the dose of 121 kg ha⁻¹ K₂O, regardless of source, although not statistically significant, thermopotash showed a average increase at 5 t ha⁻¹ compared to KCl.