

# Sugarcane technological quality cultivated in different sources of fertilization supplemented soil, using a commercial organic compost

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## Introduction

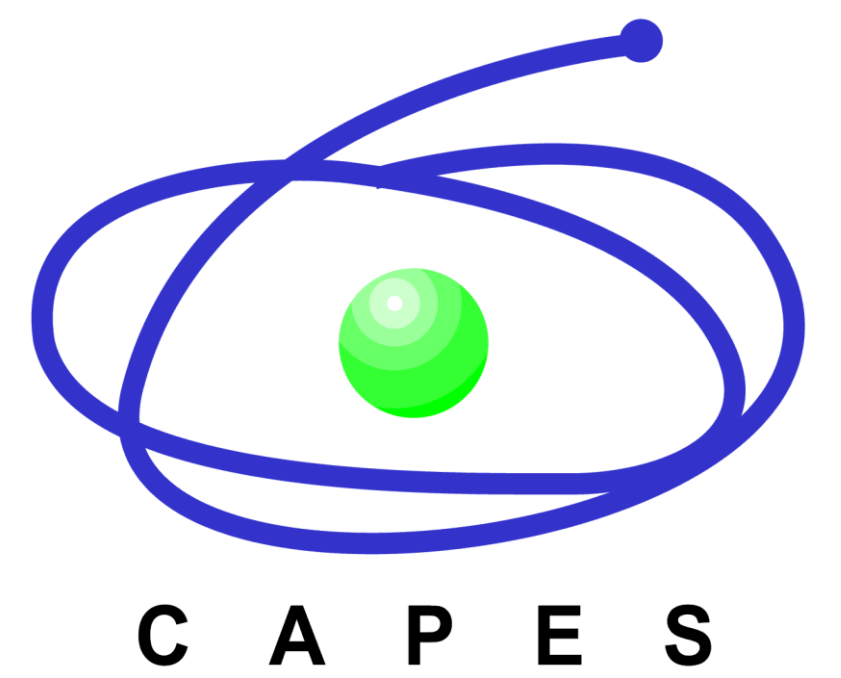
The biological fertilizer consists of adding micro-organisms to the soil, which positively influence the plant-soil interface, replacing or complementing mineral fertilizer. It has been intensified in recent years, targeting a reduction in costs for the alcohol sector. Thus, there is a great need for more research in this area

## Material and Methods

- Jaboticabal – Sao Paulo – Brazil - 21° 15' 22''S 48° 18' 58'' W
- Typic Eutruxox, calyey;
- Koppen Aw, tropical, dry winter, minimum medium temp 18°C, 1100 mm/ year (average rain);
- Plantation of the sugarcane cultivar IACSP93-3046 was on April 4th, 2009, with supplementation of different fertilization sources
- Five sources of fertilization: T1 (liming); T2 (filter cake and vinasse); T3 (filter cake, vinasse and half of the recommended phosphate fertilization); T4 (filter cake, vinasse and complete recommended phosphate fertilizer); T5 (recommended mineral fertilization). Values were presented in Table 1.
- 2 levels of application of organic fertilizer (0 and 300 L ha<sup>-1</sup>), on January 31, 2013, according to the methodology described by MICROGEO.
- Technological quality were measured, on October 13th, 2013, according to the method proposed by CONSECANA. The evaluated variants (Pol and reducing sugar) were used to calculate the Total Recoverable Sugar (TRS), using the formula: TRS = (9,5263 x Pol) + (9,05 x RS)
- Results were subjected to analysis of variance by Test F, and when there was significance, the means were compared by Test of Tukey at 5% probability.

## Conclusions

The obtained data were organized in Table 2 and Picture 1. For Pol and TRS, the treatment with no fertilization (T1) showed the higher values, explained by the longer period of sugar storage, due to the stress caused by lack of nutrients in the soil, including organic fertilization. The treatment T5, with recommended mineral fertilization, showed lower values for the same variables, explained by the short period of sugar storage, since there were favorable amounts of nutrients to the culture. The use of organic fertilizer did not influence the results. For reducing sugar, just the treatment T5 showed significant difference, achieving values reductions when utilizing organic fertilizer.

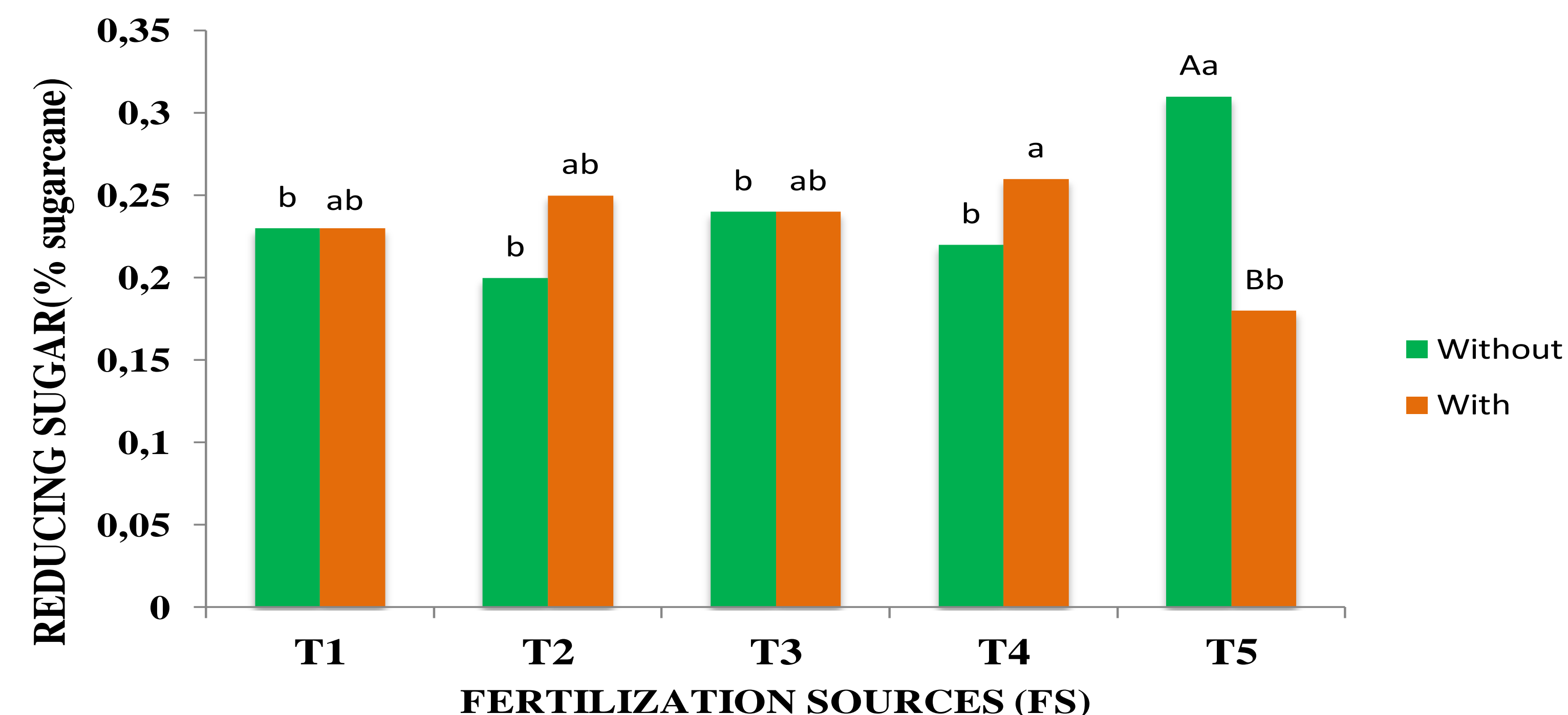


	Filter cake t ha <sup>-1</sup>	Vinasse m <sup>3</sup> ha <sup>-1</sup>	Phosphate Fertilization kg ha <sup>-1</sup>	Recommended mineral fertilization kg ha <sup>-1</sup>	Urea kg ha <sup>-1</sup>
T1	-	-	-	-	-
T2	10,4	65,0	-	-	-
T3	10,4	65,0	116,0	-	-
T4	10,4	65,0	232,0	-	-
T5	-	-	-	533,34	62,23

**Table 1.** Amount of fertilizer used according to the respective treatment in order to meet the crop recommendation. Filter cake composition: 0,015% of N, 0,161% of P and 0,20% of K; Vinasse composition: 5,81% of N, 1,84% of P and 0,13% of K; Phosphate fertilization with 17% of P<sub>2</sub>O<sub>5</sub>; Urea with 45% of N;

Change causes	Pol (% sugarcane)	Reducing Sugar (% sucarcane)	Total Recoverable Sugar (TRS) (kg t <sup>-1</sup> )
Fertilization sources (FS)			
T1	15,77 a	0,23	152,38 a
T2	15,27 ab	0,22	147,60 ab
T3	14,94 bc	0,24	144,60 bc
T4	14,66 bc	0,24	141,88 bc
T5	14,53 c	0,25	140,76 c
DMS (5%)	0,65	0,04	6,26
Organic fertilizer (OF)			
No	15,09	0,24	146,04
Yes	14,98	0,23	144,85
DMS (5%)	0,28	0,02	2,75
Statistics - Test F			
(FS)	10,76**	0,66 <sup>NS</sup>	10,25**
(OF)	0,73 <sup>NS</sup>	0,63 <sup>NS</sup>	0,82 <sup>NS</sup>
(FS x OF)	0,38 <sup>NS</sup>	9,22**	0,29 <sup>NS</sup>
Variation coefficient	2,47	11,89	6,52

**Table 2.** Average values<sup>1</sup> of Pol (% sugarcane), reducing sugar (% sugarcane) and total recoverable sugar (kg t<sup>-1</sup>), crop season 2013/2014, for the treatments, and statistical data. <sup>1</sup>Means followed by different letters in each attribute for each column differ at 5% probability by Test of Tukey. DMS - Least significant difference. NS - not Significant. \* And \*\* - Significant at 5 and 1% probability by Test F, respectively.



**Picture 1.** Interaction effect obtained between fertilization sources (FS) and the application of organic fertilizer, for the Reducing sugar (% sugarcane). Lowercase comparison between fertilization sources. Uppercase comparison between the use or nonuse of biological fertilizer.