CORRECTIVE ACTION AND FERTILIZER FROM THE ASHES OF SUGARCANE AGROINDUSTRIES.

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INTRODUCTION

The ashes from burning bagasse for co-generation of energy are important residues in the sugar industry. in terms of quantity. physical and chemical characteristics. and production workflow. However. in many aspects there is no clear definition on how to dispose of these ashes. and undoubtedly the most interesting and sustainable alternative would be the re-incorporation of these materials in the production system. The ashes may be used in low fertility soils. improving their physical and chemical characteristics. The use of ashes as a source of nutrients plays an important role in the recycling of nutrients and ecological agriculture.

OBJECTIVE

The research aimed to characterize the bagasse ashes from sugarcane mills installed in Maringá. Paraná State. Brazil. to evaluate the corrective and fertilizer potential of these ashes based on their effects on the attributes of soil fertility and development of maize plants growing on low fertility soils.

MATERIAL E METHODS

Ash samples from two alcohol and sugar mills were collected: one sample coming from a factory with production in both sandy and sandy loam soils. and another with production in clay soils. The ashes were chemically characterized (Table 01). Subsequently. soil samples of low natural fertility (Table 02) were incubated with their ashes for different values of estimated base saturation (V%) of 40%. 60%. 80% and 100%. in pots with 3 kg of soil. in a randomized block design with four replications during 53 days. In the sequence. corn was sown and cultivated in the greenhouse during 42 days. when the height of plants was evaluated. Then the maize plants were harvested. dried in forced air circulation oven to obtain the shoot dry matter.

Table 1 - Chemical composition of the ashes.

Ash from mill at	Ca	Mg	K	Na	P
	g kg^{-1} of ash				
Clay soil	5.96	3.79	6.35	0.33	2.28
Sandy loam soil	7.68	5.17	5.20	0.39	1.36

Table 2 - Chemical characteristics of the soils used in the experiment.

Soil	pH		H+Al^{3+}	Al^{3+}	Ca^{2+}	Mg^{2+}	K^{+}	SB	T	V	P
	$CaCl_2$	H_2O	cmol$_c$ dm^{-3}							%	mg dm^{-3}
Clay	4.30	4.92	7.76	1.28	1.63	1.15	0.15	2.93	10.69	27	2.5
Sand loam	3.79	4.73	7.20	0.62	0.40	0.17	0.12	0.69	7.89	8.7	6.8

RESULTS AND DISCUSSION

The ashes decreased the soil acidity (Figure 01. 02);increased soil bases. particularly potassium (Figure 3. Table 03). as well as available phosphorus (Figure 04).The use of base saturation as a criterion for the application of ashes in soil resulted in application of high doses (Table 03). It determined percentage values of potassium saturation higher than 10% in some treatments where ashes had been added. The ashes influenced the growth of plants positively as assessed by dry weight and height of corn plants (Figure 05).

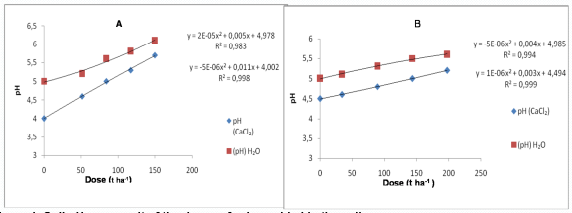

Figure 1- Soil pH as a result of the doses of ashes added in the soil. (A) sandy loam soil. (B) clay soil

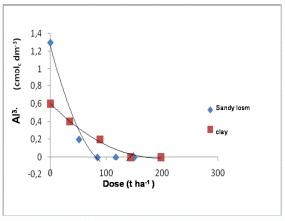

Figure 2- Exchangeable aluminum content as a result of the doses of ashes added in the soil.

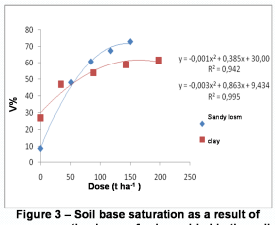

Figure 3 – Soil base saturation as a result of the doses of ashes added in the soil.

Table 3 - Soil potassium saturation as a result of the doses of ash added in the soil.

Soil	V (%)	Dose (t ha^{-1})	K (%)
Sandy loam	Vi	0	1.52
	V40	51.28	6.20
	V60	84.30	9.40
	V80	117.14	11.78
	V100	150.08	15.42
clay	Vi	0	1.40
	V40	34.38	4.27
	V60	88.62	9.18
	V80	143.1	12.67
	V100	197.6	14.96

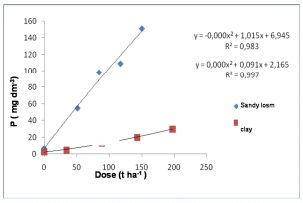

Figure 4 – Soil available phosphorus as a result of the doses of ashes added in the soil.

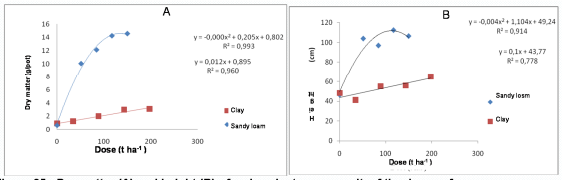

Figure 05 - Dry matter (A) and height (B) of maize plants as a result of the doses of ashes added in the soil.

CONCLUSIONS

The results indicate the feasibility of using the ashes to correct soil acidity. as well as source of nutrients for plants. especially phosphorus and potassium. in low fertility soils.