EFFICIENCY OF A HUMIC ACID BASED SOIL CONDITIONER IN SUGAR CANE CROP

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INTRODUCTION

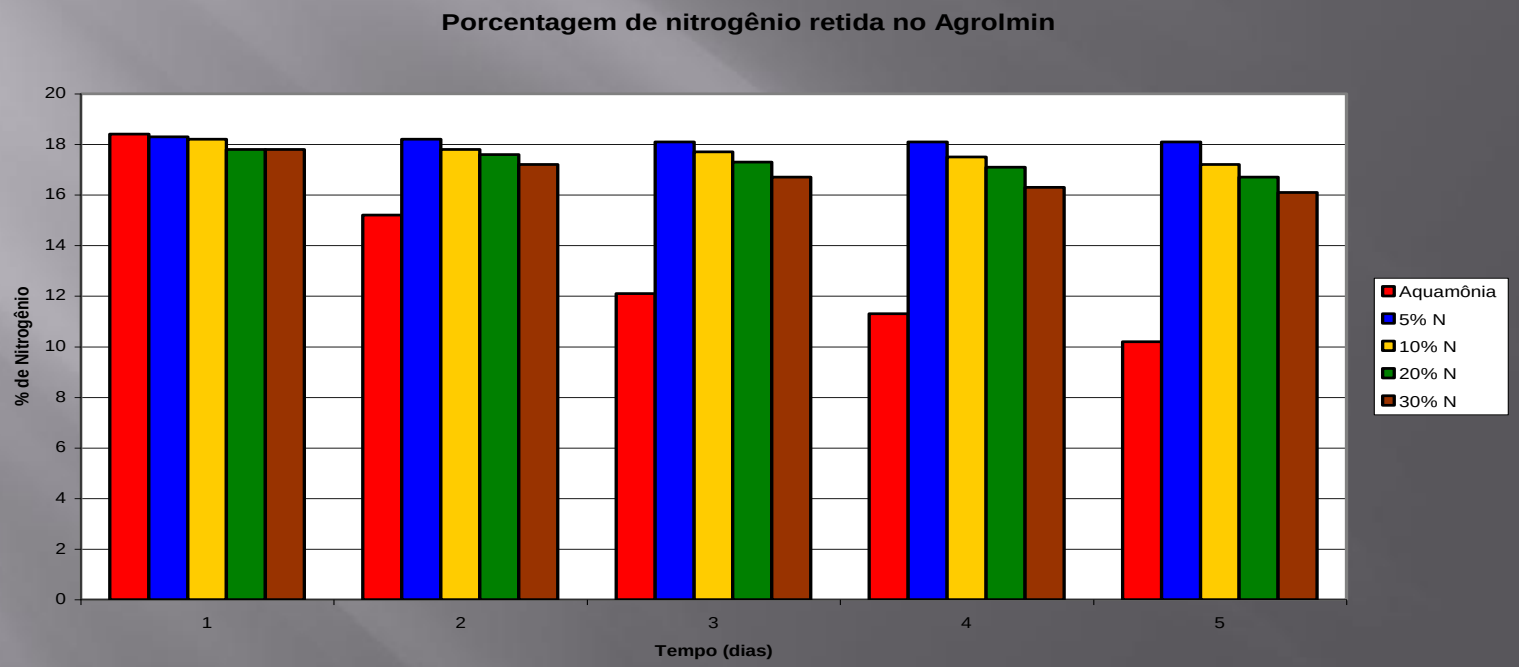
- Organic matter provides enormous benefits but little is known and few practices in large scale.
- Attempts to increase mineral fertilizers efficiency to reduce costs and increase sustainability with less emission of GHG.
- Organic minerals fertilizers with humic acids base to improve fertilization efficiency and soil properties.
- Objective is to determine effect of organic mineral humic acid to plant and ratoon cane.

HYPOTHESIS

- Humic acids have effect on the equilibrium of NH_4^+/NH_3 avoiding lixiviation and volatilization of N, keeping it available to the plant for longer periods.
- Humic acids occupied P fixation sites in soil.
- Humic acids can be absorbed by the plant and act as bio stimulator.
- Humic acids improve water retention capacity of soils.
- Use of humic acids increase sugar cane yield.

RESULTS - VOLATILIZATION

- Preliminary tests in soil columns

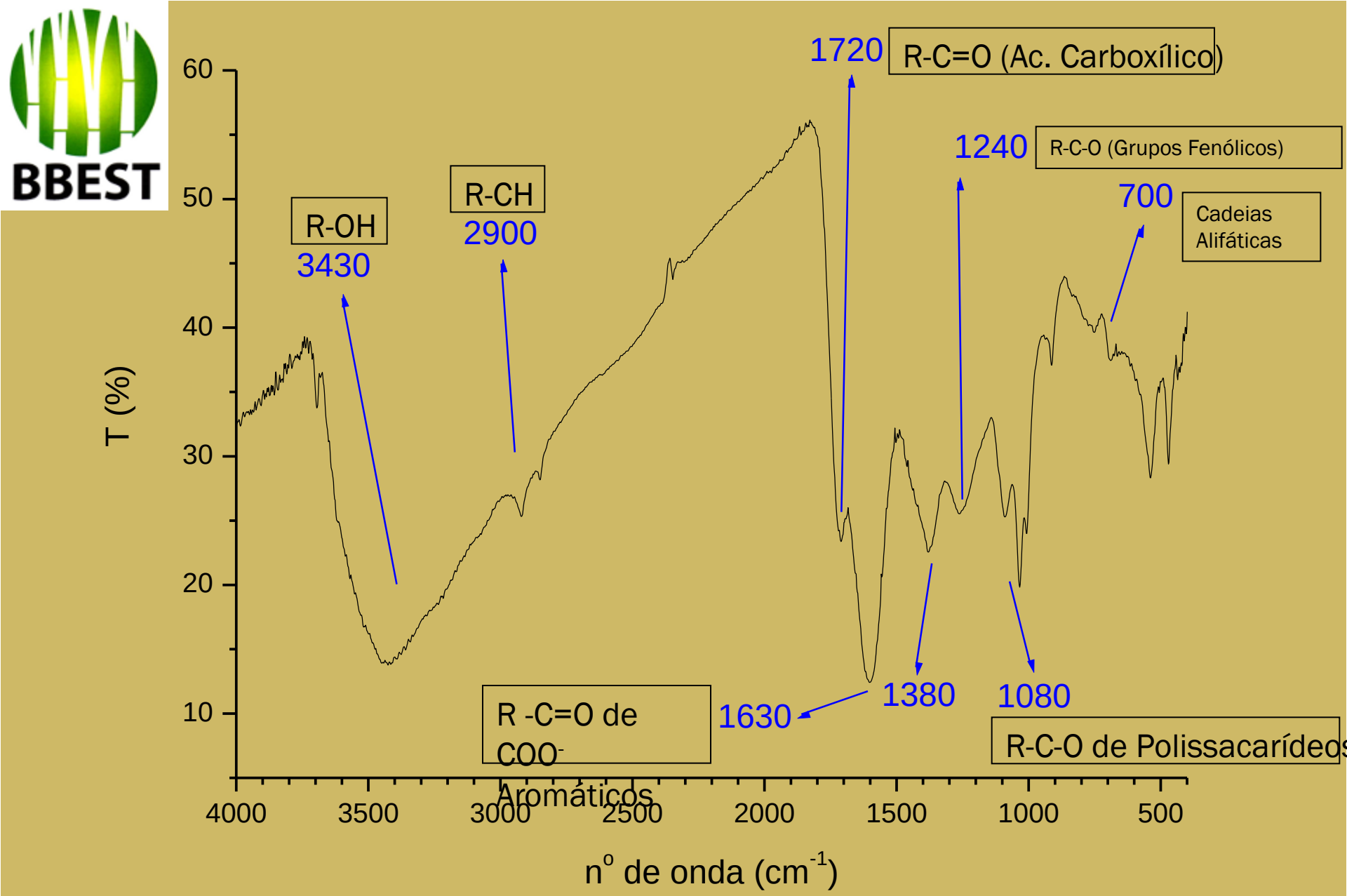


MATERIALS & METHODS

- Two field trials at Santa Cândida Mill, Bocaina, SP.
- Plant cane variety RB867515, neosoil quartzenic sandy soil, D1 production environment.
  - Application in the furrow of planting with cane seeds.
- Ratoon cane variety PO88-62, neosoil quartzenic sandy soil, D2 production environment.
  - Application during mechanical cultivation over the rows.
- Experimental design for both were randomized blocks in split plots with 4 repetitions, main treatment was 4 doses of mineral fertilizers and on plant cane two doses of humic acid as sub parcels. On ratoon there was three doses.

MATERIALS & METHODS

- Plant cane fertilizer 2.5-10-10 at 0; 800; 1600; 2400 kg/ha. Humic acid at 0 and 350 L/ha.
- Ratoon cane fertilizer 10-0-10 at 0; 800; 1600 and 2400 kg/ha. Humic acid at 0; 300 and 600 L/ha.
- Humic acid used was Agrolmin®, obtained by extraction of natural peat mine with:
  - Humic substances = 89.72%
  - Total N = 5% (padronized with mineral N)
  - pH = 5.67
- Analysis of variance performed by SAS, TUKEY 5% significance.



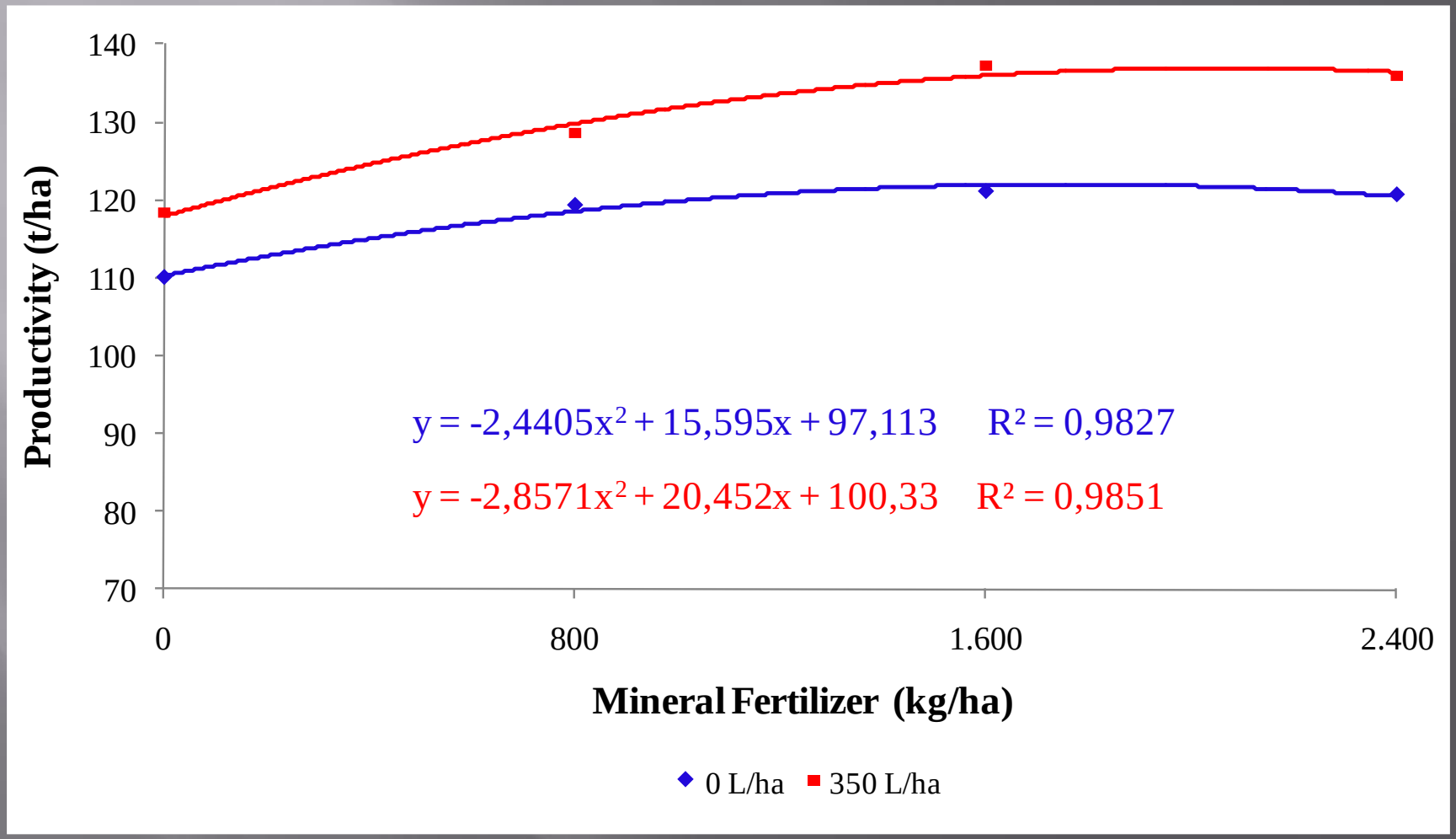
Spectrum in infrared region of humic acid sample by chromatography

RESULTS AND DISCUSSION

- **Table 1** - Averages of productivity in the cane-processing plant, variety RB 867515. Bocaina-SP. ESALQ, 2009.

Fertilizer	Doses	Productivity t/ha	Tukey
Mineral	1600	129.17	a
	2400	128.35	a
	800	123.96	ab
	0	114.13	b
Agrolmin	350	177.78	a
	0	130.02	b

RESULTS AND DISCUSSION

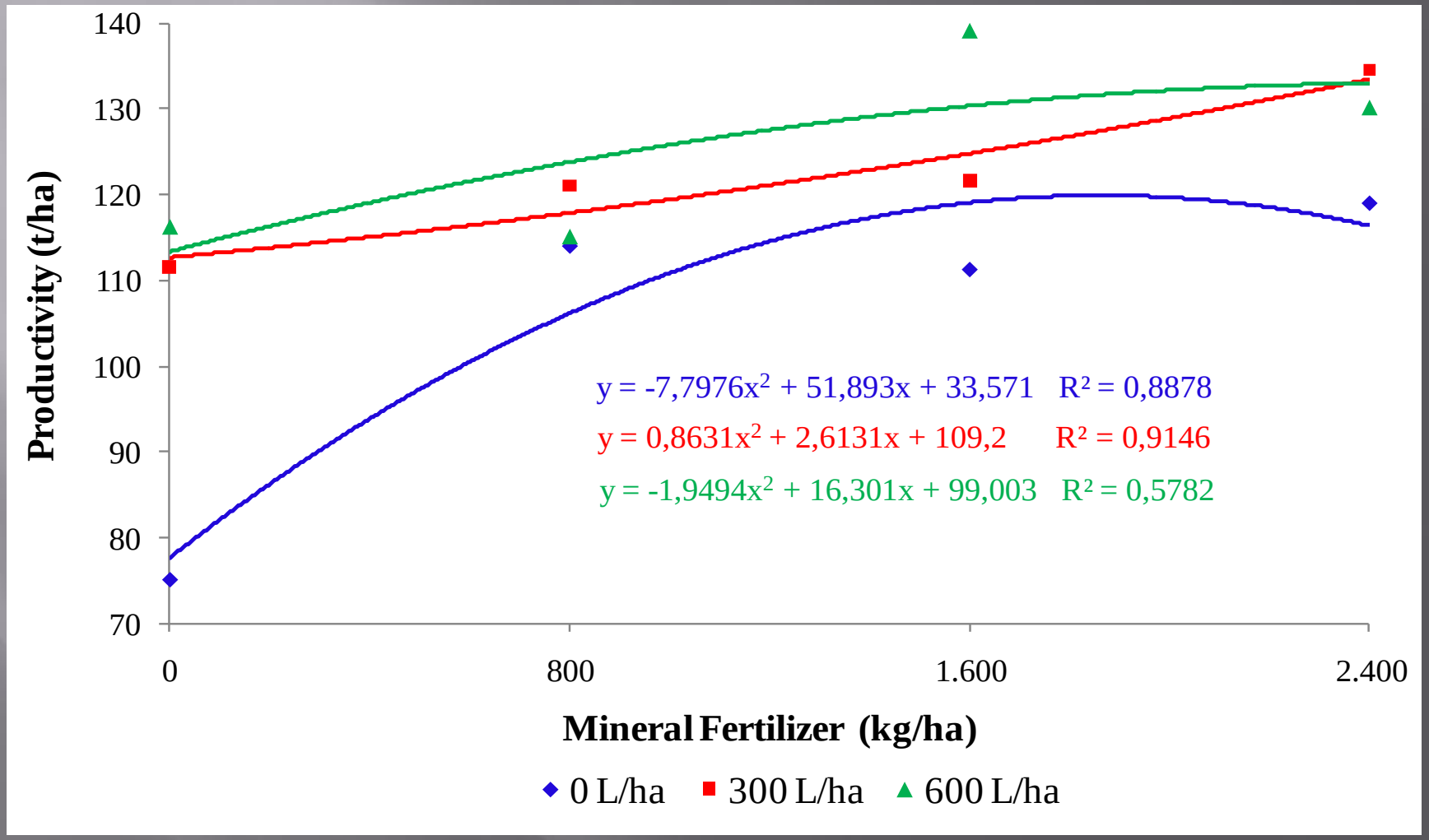


RESULTS AND DISCUSSION

- **Table 2** - Averages of productivity treatments in ratoon cane, variety PO88-62. Bocaina-SP. ESALQ, 2009.

Fertilizer	Doses	Productivity	Tukey
Mineral	2400	127.87	a
	1600	123.95	a
	800	116.71	ab
	0	100.97	b
Agrolmin	600	125.13	a
	300	122.19	a
	0	104.81	b

RESULTS AND DISCUSSION



RESULTS AND DISCUSSION

- Effect of mineral fertilizer doses as expected in both trials
- In plant cane, Agrolmin increased yield of cane in all mineral doses.
- In ratoon cane there was no answer to higher doses of agrolmin, but again there was response to agrolmin in all mineral doses.
- The use of agrolmin without mineral fertilizer produced more than absolute testimony, but better answer were obtained with the combined use of mineral and organic fertilizers.

RESULTS AND DISCUSSION

- No significant interaction between factors were found.
- During the conduct of the experiments it was observed that both plant and ratoon cane treated with humic acid showed fewer symptoms of drought like less root system, thinner stalks and shorter internodes. Cane yield was increased by number of tillers and larger diameter of the stalks. These symptoms are related to improved plant nutrition by greater absorption of nutrients.

CONCLUSION

- For plant cane the use of commercial product of humic acid had a significant increase in yield.
- In ratoon cane doses of 300 and 600 L/ha didn't differ and they resulted in significant increase in yield.
- Use of this soil conditioner show to be feasible in increasing production combined with mineral fertilization through **higher efficiency in nutrients disposability and absorption**.

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THE END

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