College of agricultural Sciences

Tuber yield and leaf concentration of nitrogen and sulfur in potato cultivated in sandy soil as affected by management of the Entec 26 nitrogen fertilizer

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INTRODUCTION

The potato crop (*Solanum tuberosum* L.) has a short cycle and high productivity per area, requiring available nutrients in the soil solution. Nitrogen (N) is a nutrient much important to increase the potato yield its deficiency may restrict the production of potato tubers and conversely the wrong management of N rates applied may increase the biomass shoot production. Thus, to improve the use efficiency of the N by crops, the nitrogen sidedressing fertilization and use of the fertilizer with nitrification inhibitor has been used to increase the availability time of the N in the sandy soils.

OBJECTIVE

The objective of this study was to evaluate the Entec 26 nitrogen fertilizer management on potato cultivated in sandy soil.

MATERIAL AND METHODS

Soil: on a Haplorthox (dystroferric red latosol).
Local: Three experiments were carried out an experimental field, with four blocks in a randomized block design, was cultivated with potato var. Ágata in the southeastern São Paulo State, Brazil (at São Manuel, and Avaré).
Treatments: two rates (120 e 160 kg ha^{-1}) of Entec 26, nitrogen fertilizer with nitrification inhibitor. The N application was divided in 40 kg N ha^{-1} at planting and the remainder N (80 e 120 kg ha^{-1}) was sidedressed at the hilling time. In addition, replications with no N application were used as control treatment.
Evaluation: It was compared nitrogen and sulfur leaf concentration, yield of total and commercial tuber class of potato (diameter > 23 mm)

Table 1. Soil chemical and physical characteristics before planting.

Field	Year	O.M.	pH (CaCl2)	P (resin)	H+Al	Ca	Mg	K	BS	CTC	V	Sand	Silt	Clay
		g dm^3		mg dm^3	mmol$_c$ dm^3						%			
São Manuel	2011	22.8	5.1	11.0	16.0	6.1	2.9	0.2	9.2	25.0	37	92.2	4.4	3.4
São Manuel	2012	22.0	5.8	57.1	13.3	12.7	4.4	0.6	17.0	29.9	57	87.4	10.2	2.4
Avaré	2012	28.2	5.8	64.4	18.6	20.6	5.8	1.9	28.2	46.8	60	86.4	12.6	1.0

Table 2. Nitrogen and Sulfur leaf concentration, and Soil chemical and physical characteristics before planting.

Treatments	Nitrogen			Sulfur			Total yield			Commercial tuber class yield		
	São Manuel 2011	São Manuel 2012	Avaré 2012	São Manuel 2011	São Manuel 2012	Avaré 2012	São Manuel 2011	São Manuel 2012	Avaré 2012	São Manuel 2011	São Manuel 2012	Avaré 2012
(kg ha^{-1} of N)	(g kg^{-1})						(kg ha^{-1})					
Control	36.6b	30.8b	36.9d	2.9a	1.5a	2.6b	13,056a	7,782b	16,712c	12,768c	7,166b	16,583c
Entec 120 planting	45.8a	33.5b	42.2c	2.9a	1.3a	3.0ab	17,398b	10,952b	22,287bc	17,049b	10,454b	22,204bc
Entec 120 sidedressed	49.0a	46.3a	51.0b	2.6a	1.1a	3.3a	25,473a	21,553a	26,763ab	25,263a	21,253a	26,689ab
Entec 160 planting	46.7a	31.1b	42.5c	3.2a	1.3a	3.1ab	21,696a	13,551b	22,322bc	21,437a	12,891b	22,289bc
Entec 160 sidedressed	48.9a	45.3a	55.7a	2.9a	1.5a	3.3a	24,501a	19,899a	29,286a	24,242a	19,644a	29,207a
LSD (0,05)	4.5	4.0	4.2	0.4	0.5	0.6	4,006	6,168	6,374	4,053	6,177	6,381
VC (%)	6.5	7.0	5.9	8.6	22.6	12.8	12.7	27.2	18.5	13.1	28.1	18.5

Values followed by different letters, in the column, were significantly different by the LSD test (p 0.05).

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CONCLUSIONS

The N sidedressed treatments increased N concentration in leaves, and S concentration was not affected by treatments. The nitrogen sidedressing fertilization treatment increased the yield of total and commercial tuber class of potato.