EFFECT OF POTASSIUM SOURCES ON THE ANTIOXIDANT ACTIVITY OF EGGPLANT

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The objective was to evaluate the effect of K sources and levels on the enzyme activity of the antioxidant system and protein content in eggplant leaves and to determine the most suitable K sources for these physiological characteristics.

Introduction

Eggplant is a horticultural species that has been largely consumed in world due to medical and nutritive potentials.

Currently domestic production of potash fertilizer in Brazil as K_2O is above 16 % and import is 83 %.

The main potassium fertilizer used in agriculture is potassium chloride followed by potassium sulphate to a lesser extent. Potassium sulfate is less “salty” than the potassium chloride.

Potassium participates in the essential processes in plant physiology, however, the effects of K sources on plant metabolism have been little studied.

Also, in certain cases, K sources and concentrations may cause undesirable effects, e.g., soil salinization. .

Materials and Methods

The experiment design used was factorial scheme with randomized blocks, 2 potassium sources (KCl and K_2SO_4) combined with 4 levels of K_2O (250, 500, 750 and 1000 kg ha^{-1}).

The following variables were evaluated: plant height, number of leaves per plant, superoxide dismutase (SOD), catalase (CAT), and leaf protein content.

Results

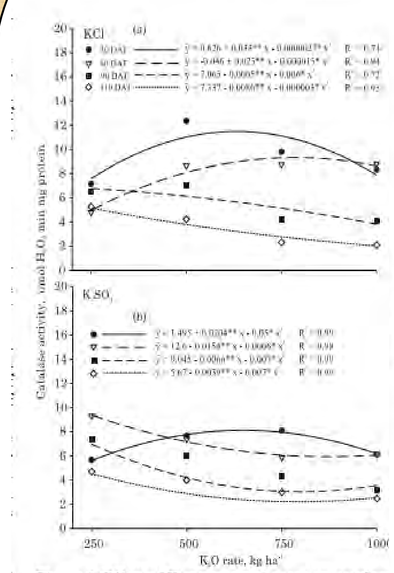

Figure 2. Effect of K sources and rates on catalase activity in eggplant leaves at 30, 60, 90, and 110 days after transplanting (DAT).

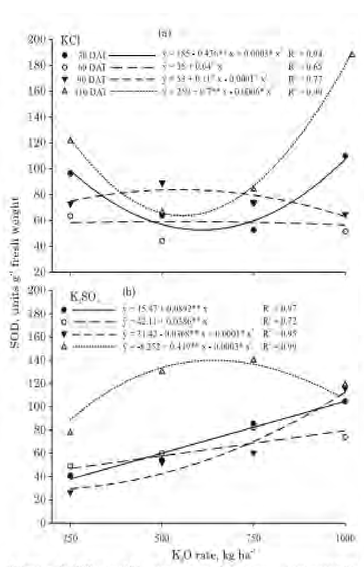

Figure 3. Effect of K sources and rates on superoxide dismutase (SOD) activity in eggplant leaves at 30, 60, 90, and 110 days after transplanting (DAT).

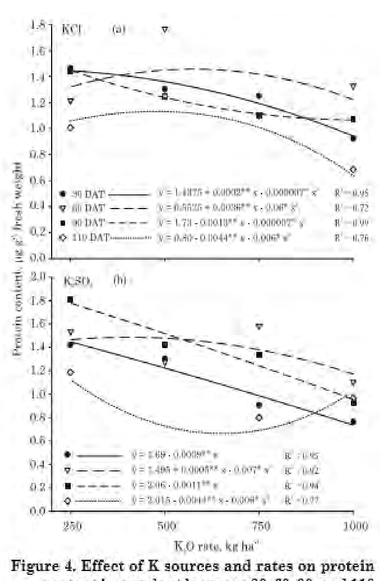

Figure 4. Effect of K sources and rates on protein content in eggplant leaves at 30, 60, 90, and 110 days after transplanting (DAT).

Table 3. Effect of K rates and sources on plant height at 30, 60, 90 and 110 days after transplanting (DAT)

Rate of K_2O	KCl	K_2SO_4	KCl	K_2SO_4	KCl	K_2SO_4	KCl	K_2SO_4
	30 DAT		60 DAT		90 DAT		110 DAT	
kg ha^{-1}	cm							
250	14.50 Aa	16.60 Aa	76.80 Aa	78.20 Aa	132.60 Aa	126.00 Aa	144.30 Aa	140.30 Aa
500	14.00 Aa	19.40 Ab	76.80 Aa	79.00 Aa	119.40 Aa	132.40 Ab	152.90 Aa	152.20 Aa
750	11.40 Aa	22.10 Ab	70.20 Aa	80.80 Ab	127.80 Aa	130.60 Aa	146.90 Aa	143.60 Aa
1000	13.40 Aa	16.72 Ab	78.40 Aa	82.00 Ab	123.60 Aa	127.20 Aa	143.04 Aa	143.16 Aa
CV (%)	17.92	17.92	9.62	9.62	8.59	8.59	10.51	10.51

Same capital letters in the column and same lowercase letters in the row do not differ from each other at the 5 % by the Scott-Knott test.

Conclusions

Thus it was concluded that KCl tends more strongly to salinize the soil than K_2SO_4.

Both for KCl and for K_2SO_4, the increasing rates adversely affected the activities of CAT and SOD and the levels of leaf protein in eggplant.

The potential of KCl to reduce the enzyme activity of SOD and CAT, leaf protein content and plant growth of eggplant was stronger than that of K_2SO_4.

Acknowledgements