

EFFECT OF ALUMINIUM ON THE GROWTH OF CASHEW SEEDLINGS (*ANACARDIUM OCCIDENTALE L.*) IN SAND CULTURE

by

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ABSTRACT

Growth stimulation was observed with aluminium application at 12 mg/l Phosphorus mobilisation was observed from root to shoot above 8 mg Al/l

INTRODUCTION

In India, Cashew (*Anacardium occidentale L.*) is grown on the denuded hill slopes of Kerala, Karnataka, Maharashtra and Goa. These soils are mainly of laterite with very low pH ranging from 3.5 - 4.5¹ and also found to contain excess amounts of exchangeable aluminium¹¹. Differential tolerance to aluminium by crop plants had been reported earlier^{10,4}. Stimulation of growth at low concentration of aluminium was also brought out in garden land crops⁹. However, no information is available on the effect of aluminium on cashew seedlings so far. With a view to examining the limit of tolerance of cashew to aluminium, a sand culture experiment was conducted at CPCRI (RS) Vittal, during 1979.

MATERIALS AND METHODS

Fresh Cashew Seeds were harvested from a single tree and sown in two litre volume transparent plastic containers filled with 2 kg acid treated sand. These containers used were double coated with one above the other with black and white paints. Application of distilled water was continued for 15 days till the seedlings were well established.

Aluminium Chloride at concentrations of 0, 4, 8, 12 and 16 mg/l in the nutrient solution⁵ adjusted to pH 4.0 was fed to these seedlings for 130 days. The pot culture treatments were replicated four times. The seedlings were later removed and washed with distilled water. Growth

characteristics namely leaf production, elongation of root and shoot, dry matter production by root and shoot and colour of the root tips were recorded.

Phosphorus content in the root and shoot⁸ was determined⁷. The data were statistically analysed.

RESULTS AND DISCUSSION

The data gathered are presented in Table 1.

Cashew seedlings were found to tolerate aluminium upto 12 mg/l. Growth characteristics such as high root density, elongation of roots and root dry matter increase was observed (Fig 1). However, the colour variation of root tips was not conspicuous.

The leaf production, height of the plants and shoot dry matter production by the seedlings increased at aluminium concentration of 12 mg/l.

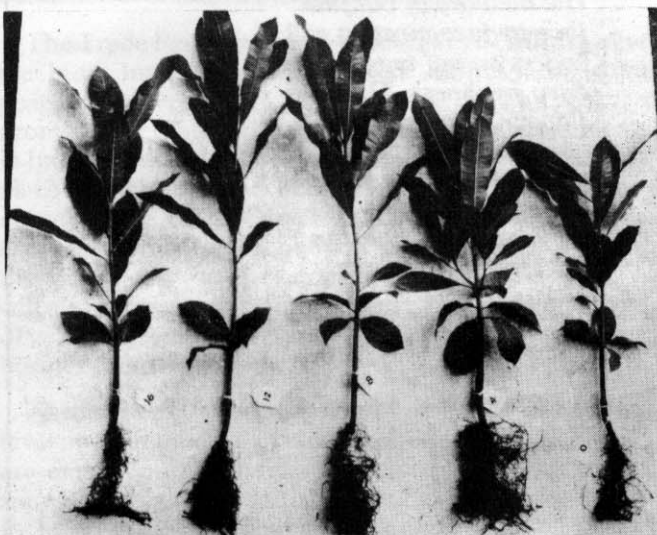


Fig.1

From left to right : Plants grown in 16, 12, 8, 4 and 0 mg/l aluminium.

Phosphorus content of the matured leaves increased with the increase in the aluminium content unlike in the root. Aluminium induced phosphorus accumulation¹² similar to arecanut⁹, Monterey pines⁶ and Cotton^{3,2} was observed in cashew also.

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Table 1
Growth characteristics and Phosphorus concentration in shoot and root of Cashew seedlings as influenced by Aluminium (mean of 4 replications)

Al conc (Mg/l)	No. of leaves emerged	Shoot length (cm)	Shoot dry matter (g)	Root length (cm)	Root dry matter (g)	Colour of the root tips	'P' content shoot	Root
0	20	41.00	6.095	13.00	1.555	White	165.50	453.00
4	26	38.75	7.942	22.00	2.060	White	580.00	462.50
8	25	43.25	8.935	17.25	2.001	Pale	542.50	575.00
12	27	46.25	8.942	17.50	2.015	Pale	736.25	470.00
16	23	44.00	7.482	18.50	2.190	Pale	803.75	397.50
LSD (0.05)	—	-NS-	1.380	3.21	0.574	—	-NS-	-NS

NS: Statistically Not Significant