LEAF NUTRIENT COMPOSITION OF ARECA PALM (*Areca catechu* L.) AS INFLUENCED BY MOISTURE STRESS AND ITS RELATION TO YIELD

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ABSTRACT

Irrigation had no influence on the leaf nitrogen content of areca palm. Phosphorus and potassium contents were influenced by moisture stress. Yield was found to be independent of the variations in the leaf nitrogen, phosphorus and potassium contents.

INTRODUCTION

Areca palms (*Areca catechu* L.) are irrigated during summer months. There is lack of information on the changes occurring in the nutrient composition of the leaf tissue of areca palm under varying levels of moisture stress. Hence attempts are made to identify the changes in the leaf nutrient composition caused by moisture levels and correlate them with the yield.

MATERIAL AND METHODS

With a view to understanding the changes brought about by moisture stress in the tissue content of major nutrients of the areca palm, and resultant reduction in yield, if any, investigations were carried out in an ongoing experiment. The experiment was initiated in 1970, adopting strip-plot design with three depths of planting (30, 60 and 90 cm) and four irrigation treatments, viz.

I_1 30 mm depth of irrigation water when CPE is 30 mm ($\frac{IW}{CPE}$=1.0)

I_2 30 mm depth of irrigation water when CPE is 60 mm ($\frac{IW}{CPE}$=0.5)

I_3 60 mm depth of irrigation water when CPE is 60 mm $\frac{IW}{CPE}=1.0$)

I_4 60 mm depth of irrigation water when CPE is 120 mm $\frac{IW}{CPE}=0.5$)

The crop received 100 g N, 40 g P_2O_5, and 140 g K_2O/palm/year in two equal splits, one in September–October, and the other in February–March.

Leaf samples were collected during the month of May and chemical analysis was carried out. The methods given by Jackson, (1957) was followed for estimating N, P, and K.

Results and Discussion

Soil moisture stress did not bring about any significant variation in the leaf N content of areca palm. However, irrigating the crop at half the cumulative potential evaporation $\frac{IW}{CPE}=0.5$) with 30 and 60 mm depth of irrigation water recorded slightly higher contents of leaf N (2.3 to 2.5%) (Table 1). Irrigation at

Table 1. *NPK content of areca leaf and yield as affected by different schedules of irrigation*

Irrigation treatments	Concentration (%)			Yield (wet wt. of nuts) (kg/palm)
	N	P	K	
I_1 30 mm depth of irrigation when CPE is 30 mm.	2.268	0.136	1.510	14.53
I_2 30 mm depth of irrigation when CPE is 60 mm.	2.338	0.150	1.710	14.29
I_3 60 mm depth of irrigation when CPE is 60 mm.	2.296	0.160	1.690	11.04
I_4 60 mm depth of irrigation when CPE is 120 mm.	2.450	0.173	1.710	7.87
CD (0.05)	NS	0.013	0.152	4.11

NS - Not significant

$\frac{IW}{CPE}$ ratio of 0.5 recorded significantly higher content of leaf P both in 30 and 60 mm depths of irrigation water compared to

those palms receiving irrigation at $\frac{IW}{CPE}$ ratio 1.0, depths of irrigation water, being the same.

The content of K in the leaf was significantly low in treatment $\frac{IW}{CPE}$ ratio 1.0 under 30 mm depth of irrigation water (Table 1). From the results, it is seen that the P and K uptake by areca palm and accumulation in the tissue is very sensitive to soil moisture variations.

It is also seen that the yield has no apparent association with the leaf nutrient composition of areca palm (Table 2).

Table 2. *Correlation coefficients of leaf NPK content with yield*

Nutrient	Mean content (%)	'r' value
N	2.340	0.1277_{NS}
P	0.155	-0.0200_{NS}
K	1.655	-0.3086_{NS}

NS Not significant.

REFERENCE

JACKSON, M. L. 1967. *Soil Chemical Analysis.* Prentice Hall of India Pvt. Ltd., New Delhi.