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QUALITY OF COPRA AND OIL OF COCONUT AS INFLUENCED BY SODIUM CHLORIDE NUTRITION

The effect of application of sodium chloride on growth and yield of coconut palms grown in laterite soil has already been reported (Prema *et al.*, 1987). In this paper, the influence of soil application of sodium chloride on the quality of copra and oil is discussed. The nut samples for this study were collected from the experimental palms maintained at the Regional Agricultural Research Station (Kerala Agricultural University), Pilicode, Kasaragod, Kerala. This experiment was laid out in 1 976 in randomised block design with six treatments and four replications maintaining six palms in each plot. The treatments were:

T_1 Control
T_2 1000 g K_2O/palm/year
T_3 750 g K_2O + 250 g Na_2O/palm/year
T_4 500 g K_2O + 500 g Na_2O/palm/year
T_5 250 g K_2O + 750 g Na_2O/palm/year
T_6 1000 g Na_2O/palm/year

The experiment consists of hybrid palms on which the above treatments were superimposed in 1 976 when the palms were 24 years old. Till then these palms were receiving N, P and K according to the Package of Practice Recommendations of the Kerala Agricultural University (Anon, 1976). These palms also received 500 g N, 320 g P_2O_5, 300 g CaO and 170 g MgO and cultural practices as recommended (Anon, 1 976). The crop was rainfed with an average annual rainfall of 3200 mm. The soil was typically laterite in nature, the basic properties of which have already been reported (Prema *et al.*, 1 937). Nut samples were collected at the rate of two nuts per palm from two palms at random from each plot during 1986, that is 10 years after the imposition of the treatments.

The determination of Na and K in fresh coconut water, N, P, K, Ca, Mg, Na and Cl in copra, extraction of oil from copra and quality analysis of oil were carried out following standard procedures (Jackson, 1958, Hesse, 1972; Anon., 1972).

The K content of coconut water was found correlated with copra weight per nut (0.5388**). This would show the role of K in the proper development of nuts. Sodium content of coconut water was significantly influenced by the treatments (Table 1). The level of Na in coconut water increased with increasing application of NaCl and the mean values for T_6, T_5, T_4, T_3 and T_2 were 0.052, 0.048, 0.047, 0.034 and 0.031 per cent respectively. The treatment,

Table 1

Effect of sodium chloride on nutrient content of coconut water, copra weight/nut, oil recovery and nutrient content of copra

No.	Treatment		Coconut water		Copra weight per unit, g	Oil reco-very %	Nutrient content of copra %						
	K_2O g/palm/ year	Na_2O g/palm/ year	K%	Na%			N	P	K	Na	Ca	Mg	Cl
1	0	0	0.203	0.048	123.31	56.47	1.573	0.226	0.776	0027	0.116	0.063	0.168
2	1000	0	0.231	0.031	109.19	57.37	1.616	0.211	0.606	0.018	0.117	0.054	0.168
3	750	250	0.264	0.034	134.75	52.99	1.401	0.190	0.662	0.019	0097	0.069	0.214
4	500	500	0.242	0.047	131.88	60.47	1.443	0.205	0.768	0.024	0.094	0.071	0.213
5	250	750	0.247	0.048	106.44	54.20	1.494	0.221	0.740	0.027	0.291	0.074	0.189
6	0	1000	10.82	0.052	125.81	58.48	1.452	0.219	0.673	0.047	0.104	0.068	0.173
			NS	0.083	NS	NS	NS	NS	NS	0.113	NS	NS	NS

T_6 differed significantly from T_3 and T_2. The treatments T_6, T_5 and T_4 were statistically on par. The content of Na in T_1 (control) was relatively higher (0.048%) as compared to that of T_2. This can be attributed to the antagonism between Na and K. In T_2 the high level of K employed would have reduced the uptake of Na while such an antagonism cannot be anticipated in T_1, thus registering a relatively higher value for Na. Sodium content of coconut water was significantly correlated with Na content of copra ($r = 0.6985^{**}$).

The treatments did not differ in their influence on copra weight per nut and percentage oil recovery. This shows that application of Na instead of K will not reduce the copra weight per nut or the percentage oil recovery.

The treatments did not differ significantly in their influence on the N, P and K, Ca, Mg and Cl content of copra. Irrespective of the proportion of K or Na nutrient accumulation in copra remained the same. The contents of Ca and Mg in copra were found to be negatively correlated ($r = 0.6354^{**}$) indicating the antagonism between these two divalent cations.

The Na content of copra was influenced by the treatments. Increasing rate of application of Na resulted in a corresponding increase in the Na content of copra. Thus the mean values were 0.041, 0.027, 0.024, 0.019 and 0.018 per cent respectively. The treatment T_6 differed significantly from all other treatments. However, T_5, T_4, T_3 and T_2 were statistically on par.

The treatments did not differ in their influence on the specific gravity, refractive index, saponification value and iodine value of coconut oil (Table 2). The

Table 2

Influence of sodium chloride treatments on the quality of coconut oil

No	Treatment K_2O g/palm/year	Treatment Na_2O g/palm/year	Specific gravity	Refractive index	Saponification value	Iodine value
1	0	0	0.909	1.449	267.53	7.792
2	1000	0	0.914	1.450	263.88	7.673
3	750	250	0.913	1.449	272.16	7.893
4	500	500	0.912	1.449	268.32	7.227
5	250	750	0.912	1.449	266.88	8.280
6	0	1000	0.919	1.450	266.53	7.978
CD (0.05)			N. S	N. S	N. S	N. S

values of these quality parameters of oil are within their normal range for coconut oil. The results reveal that the quality of oil is not affected by the substitution of KCl by NaCl to various extent.

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