

**STUDIES ON FOLIAR AND SOIL APPLICATION OF
FERTILIZERS ON CASHEW (*ANACARDIUM OCCIDENTALE*)**

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Foliar application of nutrients to crops has been accepted as one of the means of economic utilisation of fertilizers. Possibility of enhancing the efficiency of utilisation of major nutrients through foliar sprays on perennial fruit crops had been attempted on several crops. Fleming and Alderfer (1949) concluded that there was no significant effect on yield or vigour of grape vine from four urea sprays applied during three years. Fisher and Cook (1950) observed that under favourable conditions, spraying apple trees three times with urea during the growing season produced higher yield than soil application of an equivalent amount of nitrogen; but in the following seasons both three and four spray treatments were approximately equal in efficiency to corresponding rates of soil application. Bullock and Benson (1952), with trials of foliar sprays on peach trees, concluded that none of the methods affected total yield. Venketaramani (1957) reported that foliar application of both potassium and N. P. K. mixture on tea, has given significant increase in yields over that obtained from untreated plots. In the absence of reported experimental evidence on similar lines on cashew, the present work was undertaken.

Materials and Methods

The experiment was conducted at the Agricultural College farm Vellayani over a period of two years from 1963 to 1965. Seven-year-old cashew trees of uniform vigour were selected for the trial. The trees were manured with farm yard manure at the rate of 5 kg per tree per year. The nuts were harvested periodically and the yield was recorded. The trees were then grouped according to their yield character. Thus, four groups with seven trees in each group were selected for the experiment. Each group represented a replication; there being seven trees representing seven treatments. The experiment was laid out in randomised block design. The treatments were the following.

- T₁ Soil application of 0.2214 kg of N per tree.
- T₂ Soil application of 0.2214 kg of urea per tree, plus water spray.
- T₃ Foliar application of 0.2214 kg of N per tree.
- T₄ Soil application of 0.2214 kg of N, 0.0605 kg of P₂O₅ and 0.2718 kg of K₂O per tree.

- T₅ Soil application of 0.2214 kg of N, 0.605 kg of P₂O₅ and 0.2718 kg of K₂O per tree plus water spray.
- T₆ Foliar application of 0.2214 kg of N, 0.0605 kg of P₂O₅ and 0.2718 kg of K₂O per tree.
- T₇ Control-water spray only.

Urea, super phosphate and muriate of potash were used as the sources of nitrogen, phosphorus and potassium, respectively. The fertilizers were given in a single dose. The foliar sprays were given one month before the initiation of flower primordia. The volume of the spray material was kept constant as 9.090 litres per tree. A surfactant 'Teepol B.300' was added at a concentration of 0.1%. Visual scorching effect on the leaves and yield of nuts per tree were recorded. The N, P, K contents of apple and nuts were chemically determined.

Results and Discussion

The data was analysed on the basis of the adjusted means of the pre-treatment yield data (Table 1). No visual scorching effect was noticed in any of the foliar treatments. Samples of apples and nuts collected from all the treatments were analysed chemically and the results are tabulated in Tables 2 and 3.

The results showed non-significant differences in yield of nuts between treatments. Even the combined application of all the three major elements by foliar spray has failed to bring about improvement in yield over control. That, no apparent advantage was brought about even during the second season points to the probability of adequacy of all the three elements. This will be further substantiated by a study of chemical analysis data (Tables 2 and 3). No significant differences in content of nitrogen,

Table 1
Adjusted mean yield of nuts as affected by treatments

Treatment	Yield of nuts (number per tree)	
	1963-1964	1964-1965
T ₁	1475	570
T ₂	813	317
T ₃	545	365
T ₄	977	452
T ₅	847	556
T ₆	627	373
T ₇	1564	492
F test	NS	NS

Table 2
Percentage content of nitrogen, phosphorus and potassium
of fruits on oven dry basis

Treatment	Percentage of element					
	1963-1964			1964-1965		
	N	P	K	N	P	K
T ₁	1.260	0.296	1.280	0.604	0.293	1.116
T ₂	1.106	0.241	1.235	0.694	0.285	1.304
T ₃	1.400	0.269	1.547	0.677	0.284	1.773
T ₄	1.176	0.227	0.978	0.887	0.296	1.573
T ₅	1.036	0.242	1.345	0.474	0.335	1.537
T ₆	1.152	0.235	1.672	0.458	0.189	0.839
T ₇	1.358	0.236	1.589	0.542	0.252	1.136
F test	NS	NS	NS	NS	NS	NS

Table 3
Percentage content of nitrogen, phosphorus and potassium
of nuts on oven dry basis

Treatment	Percentage of element					
	1963-1964			1964-1965		
	N	P	K	N	P	K
T ₁	2.420	0.752	1.834	2.320	0.697	1.345
T ₂	2.202	0.834	1.385	2.465	0.701	1.782
T ₃	2.800	0.679	1.932	2.756	0.732	1.699
T ₄	2.362	0.599	1.782	2.172	0.752	1.756
T ₅	2.072	0.721	1.992	2.234	0.678	1.834
T ₆	2.324	0.748	1.872	2.362	0.722	1.549
T ₇	2.716	0.632	1.532	2.245	0.801	1.732
F test	NS	NS	NS	NS	NS	NS

NS. Not significant

phosphorus and potassium between treatments was noticed either in apple or in nuts. The foliar feeding even as close as the flower initiation stage did not register corresponding increases in nutrient contents of fruits and nuts. The fact that the period of study was insignificant as compared to the total life span of the crop under trial may also be pointed out as one of the reasons for the absence of response.

Summary and conclusions

An exploratory trial to find out the utility of application of nitrogenous, phosphatic and potassic fertilizers to cashew through soil as well as through foliage was undertaken. Addition of fertilizers either to soil or through foliage was not effective in increasing the yield of nuts and fruits, significantly.

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