

INCREASING FRUIT SET IN CASHEW BY HORMONE SPRAYING*

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ABSTRACT

A study was conducted to determine the effectiveness of seven of the most common plant hormones on fruit set in cashew and also to determine the optimum dosages for each and appropriate time for spraying. All the hormones were able to increase fruit set considerably but 2, 4-D, NAA, and IBA were the best, giving more than 50% fruit set over the control. It was difficult to determine the optimum time for spraying because of the long flowering phase of each panicle and the completely overlapping flowering in the large number of panicles produced in each tree. The study showed also that the beneficial effects of hormone spraying were seriously upset by severe incidence of inflorescence blight.

INTRODUCTION

THE yield of cashew is very low. One of the important reasons for this is the poor fruit set and high immature nut fall following fruit set. Rao (1956), for instance, observed only 3% fruit set in cashew in the west coast of India and Dasarathi (1958) obtained only 6-12% set in the east coast.

It is well known that various types of plant growth regulators are able to increase fruit set and reduce immature fruit drop considerably. In the present studies, the effect of seven plant hormones were tested on fruit set in cashew and positive results were obtained.

MATERIALS AND METHODS

The studies were conducted in two seasons, in 1972-73 and 1973-74. The hormones used were GA, NAA, IAA, IBA, 2,4-D, and Planofix (a proprietary product of May and Baker containing NAA). In the first year, the study was directed to determine the median tolerance doses of these hormones and also the appropriate time for spraying. In the second year, the comparative efficacy of these hormones was tested at the median doses on large numbers of trees.

In the first year, 30 inflorescences were used per treatment and sprayings were done

at three stages of development, namely, (1) when 25% of the male flowers were open; (2) when 50% of the male flowers were open; and (3) when 75% of the male flowers were open. Because of the very nature of the long flowering phase in cashew, it is obvious that there has had to be some arbitrariness in fixing the timings for spraying. The dosages used were: GA at 2, 5, 10, 20, 50, 10+10, and 10+5 ppm; NAA at 2, 5, 10, 20, 50, 10+10, and 10+5 ppm; IAA at 20, 50, 100, 200, 500, 100+100, and 100+50 ppm; IBA at 5, 12, 25, 50, 125, 25+25, and 25+12 ppm; 2, 4-D at 2, 5, 10, 20, 50, 10+10 and 10+5 ppm; and Planofix at 0.5, 1.0, 2.0, 1.0+1.0, and 1.0+0.5 ml in 4.5 l water. The two figures in the last two treatments for each hormone represent two sprays, with the second spray applied 14 days after the first.

The second series of sprayings were carried out in 1973-74 for confirming and extending the results obtained in the previous year. For this, four sets of experiment were conducted, two sets with 125 trees each in the Savanoor Forest Orchards (38 km from Vittal), one set with 50 trees at the Survey Forest Orchards (35 km from Vittal)—both belonging to the Karnataka State Forest Department—and the fourth trial was carried out on 20 trees at Vittal. These trees were initially sprayed with 0.1% dimethoate to protect them from inflorescence blight. The spraying

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were given when about 25% of the panicles had begun to flower. The hormones used were IAA (10 ppm), IBA (25 ppm), NAA (10 ppm), and Planofix (1ml in 4.5l water). Half the trees in the first series were sprayed for a second time two weeks after the first spray, with the same hormones as used for the first spray. Panicles at the top of each tree were left without spraying as control. The fruit set count was taken once before the final harvest.

For various reasons, including a heavy incidence of inflorescence blight in spite of the insecticidal spray, proper data on fruit set could not be obtained for all the treatments in all the series of experiments. Because of this, and also because the results obtained in the various series were broadly consistent, pooled data are presented in the paper.

RESULTS AND DISCUSSIONS

The pooled results of the four sets of trials conducted in the second series are given in Table I. These results show that NAA, IBA, and 2, 4-D sprays gave the best results. Interestingly, these were the same hormones which gave the highest yields in the first year's trials also. Further, in both the years, a double spray of NAA was superior to its single spray. In the case of IBA and 2, 4-D, the single sprays were better than double sprays.

It should be pointed out here the results may have been viciated here by the severe infection of inflorescence blight. However, since the second series of trials had been carried out on a large number of trees, the results could be taken to be reasonably reliable.

TABLE I
Effect of hormone sprays on fruit set

Sl. No.	Treatment	No. of sprays	Percentage set over control
1.	2, 4-D, 10 ppm	Single	57
2.	2, 4-D, 10 ppm	Double	36
3.	NAA, 10 ppm	Single	51
4.	NAA, 10 ppm	Double	107
5.	IBA, 25 ppm	Single	55
6.	IBA, 25 ppm	Double	24
7.	IAA, 100 ppm	Single	12
8.	IAA, 100 ppm	Double	20
9.	Planofix, 1 ml in 4.5 l water	Single	41
10.	Planofix, 1 ml in 4.5 l water	Double	4

Though the present study has shown clearly the beneficial effect of hormonal spray in increasing yields, it appears to us that even much better results could have been obtained with hormone sprays if proper remedial measures had been taken to check the ravages of inflorescence blight.

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