

Aerial Spraying Against Tea Mosquito in Cashew

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Abstract

Comparative efficacy of ultra low volume (aerial spray) and the high volume spray (employing rocker sprayer) for the control of tea mosquito was evaluated during 1977-78 season in the cashew plantations of Kerala Plantation Corporation at Muliya, Adhur and Perla villages, in Kerala, India. Two sprays were given in November, 1977 and January, 1978 synchronising with the emergence of new flushes and inflorescences. The infestation of shoots and inflorescences was significantly reduced in the plots which received aerial spraying and the yield increase was 40 per cent for the number of nuts and 37 per cent for the weight of nuts harvested over the plots receiving high volume spray (2.2 kg Vs 1.6 kg per tree).

Introduction

Among the major pests of cashew *Helopeltis antonii* Sign., popularly known as 'tea mosquito' is the most serious pest causing heavy economic losses. Abraham (1958) observed that the yield loss due to this pest exceed 30 per cent. Adults and immature stages of this bug suck sap from the tender shoots, leaves, panicles, developing nuts and apples. As such, timely adoption of suitable plant protection measures with appropriate insecticides will control the pest population. Pillai and Abraham (1975) reported the trends in build up of pest population synchronising with the emergence of new flushes and panicles. Chemical control trials conducted at Kasaragod revealed that endosulfan 0.05 per cent applied as high volume spray or 0.1 per cent as low volume spray at the time emergence of new shoots, panicle and fruit set was effective in controlling tea mosquito population and reducing the crop losses (Pillai, Dubey and Vijay Singh, 1976). To cover extensive areas of cashew plantation within the short critical period during which the build up of the tea mosquito population commences and reaches its peak, aerial spraying seem to be the most suitable. This is specially true for plantations situated in hilly tracts. In this paper an attempt

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has been made to evaluate the comparative efficacy of aerial spraying *vis-a-vis* mechanical spraying using rocker sprayers and to work out the cost benefit ratio of both the plant protection methods.

Materials and Methods

The field experiment was conducted at seven locations in the cashew plantations at Muliyar, Adhur and Perla villages of the Plantation Corporation of Kerala. From each location strips of about ten hectares were marked separately and divided into three portions. One portion was aerially sprayed with endosulfan (1.0%) through helicopter, in the second endosulfan (0.5%) was sprayed using rocker sprayers and third portion was left as unsprayed control. Three clusters of three trees from each portion were selected at random having a border of four rows of trees around. Thus 189 trees were selected for this experiment. Ten leader branches were randomly selected and labelled from each tree. The pre-treatment observations on the total number of laterals, flowering laterals and number of shoots and panicles infested with tea mosquito were recorded from each leader. Two rounds of spray one in the second half of November, 1977, at the time of emergence of new flushes and inflorescences and the second in the third week of January, 1978 were given, when the build up of pest population was noticed. The post treatment observations were recorded after an interval of one month. The yield of nuts was recorded for the complete season from five locations at Muliyar and Adhur. An estimate of cost for the two methods of spraying was worked out.

Results and Discussion

The present experiment has confirmed the efficacy of endosulfan treatment in controlling the tea mosquito infestation of shoots and panicles (Table 1). Among the two different methods of treatment aerial spraying gave significantly superior results. In terms of angular values, the mean infestation was 8.28 and 26.63 for shoots and panicles respectively in plots receiving aerial spray, compared to 14.42 and 36.08 in plots covered by rocker spray, whereas in control plots the figures were as high as 24.85 and 58.58, for infestation in shoots and panicles respectively. For both the characters wide variability was observed between locations.

Compared to control the yield per tree was higher by 80 per cent for number of nuts as well as weight of nuts in plots covered by aerial spraying and by 30 per cent in plots which received high volume spray (Table 2). However, these differences in yield were not statistically significant and this may be attributed to the high degree of heterogeneity existing between cashew trees, as evidenced by the high coefficient of variation (around 90%). These

TABLE 1. Mean Percentage (transformed values) of Infestation of Shoots and Panicles.

Location	Shoots			Panicles		
	Aerial spray	Rocker spray	Control	Aerial spray	Rocker spray	Control
Muliyar (1)	2.31	7.06	11.70	21.55	31.49	58.52
(2)	2.42	6.33	18.13	22.05	28.00	55.93
Adhur (3)	15.09	19.54	42.44	27.18	40.59	59.30
(4)	11.26	32.40	42.76	36.06	45.30	72.58
(5)	1.19	2.31	7.35	27.48	39.31	49.58
Mean*	6.45	13.53	24.48	26.86	36.94	59.18
Perla (6)	13.29	16.79	26.86	28.99	30.43	49.48
(7)	12.42	16.51	24.69	23.07	37.47	64.68
SE/plot		7.74				9.88
C.V. %		48.80				24.44
C.D. for locations		7.37				9.41
C.D. for treatment		4.82				6.16
Mean	8.28	14.42	24.85	26.63	36.08	58.58

*Mean for the first five locations only

TABLE 2. Mean Yield of Nuts / Tree

Locations	No. of nuts			Weight of nuts (kg)		
	Aerial spray	Rocker spray	Control	Aerial spray	Rocker spray	Control
Muliyar (1)	208.4	181.1	191.2	1.426	1.122	1.190
(2)	415.3	208.3	88.8	2.628	1.347	0.595
Adhur (3)	330.8	402.9	220.2	2.110	2.708	1.522
(4)	413.6	124.8	60.7	2.623	0.917	0.420
(5)	325.7	293.1	362.9	2.213	1.942	2.418
Mean	338.8	242.0	184.8	2.200	1.607	1.229
S.E./Plot		227.27				1.520
C.V.%		89.06				92.14

inter-tree variations have affected the observations on shoot and panicles only to a lesser extent because these observations were restricted to few randomly selected leader branches in each tree, whereas for yield observations the whole tree was taken as the unit. Possibly a third round of spraying during March when fruit set is at its peak, would have made the differences in yield more clear.

The actual expenditure incurred by the Plantation Corporation of Kerala for one round of spraying was Rs. 60/ha whereas the cost of spraying by rocker sprayer was Rs. 76/ha (Anon, 1976). At the 1978 rates of Rs. 6.00 per kg for raw nuts the net income from one hectare of cashew garden would be Rs. 1069 for unsprayed plots, compared to Rs. 1244 for rocker sprayed plots and Rs. 1794 for plots covered by aerial spraying (Table 3). The incremental cost benefit ratio worked out to be 1:2.1 for mechanical spraying compared to 1:5.9 for aerial spraying (at the 1984 rates the ratios are 1:1.5 and 1:5.8 for mechanical and aerial spraying respectively (Table 3)).

TABLE 3. Economics of spraying (one hectare)

		<i>Control</i>	<i>Rocker spray</i>	<i>Aerial spray</i>
<i>Pesticides</i>	Value (Rs.)	..	90 (126)	74 (104)
<i>Spraying</i>	Mandays	..	3 (—)	6.6 (—)
	Cost (Rs.)	..	24 (42)	6 (8)
<i>Other Expenses</i>	(Rs.)	..	40 (50)	40 (50)
<i>Total</i>		..	154 (218)	120 (162)
Harvesting charges	50 Ps./kg. (Rs.)	37 (92)	48 (92)	66 (165)
<i>Total Expenses</i>	(Rs.)	37 (92)	202 (338)	186 (327)
<i>Yield</i>	<i>Quantity</i> (Kg/ha)	184.5	241	330
	<i>Value</i> (Rs.)	1106 (2029)	1446 (2651)	1980 (3630)
<i>Net Income</i>	(Rs.)	1069 (1937)	1204 (2313)	1794 (3303)

Figures in paranthesis are 1984 values

In the present study a helicopter could spray about 400 – 500 ha in a day whereas 400 – 500 mandays are required for covering the same area by conventional methods. Economy in the use of water was an added advantage in places where water scarcity exists.

Acknowledgement

The authors are very much indebted to Dr. M.C. Nambiar, Project Co-ordinator, (Spices and Cashew), Kasaragod for the guidance and keen interest in this experiment, Dr. N.M. Nayar, Director, C.P.C.R.I., Kasaragod, Shri. R. Ravindran, Managing Director, Shri. N.K. Gopalakrishnan, General Manager (Cashew), Plantation Corporation of Kerala, Kottayam and their staff at Muliyar, Adhur and Perla for providing us all the facilities.

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