Managing Hopper Population in Mango Orchards

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Mango (*Mangifera indica* Linnaeus), a seasonal fruit is popular throughout the country. The trees lose vigour and suffer heavily due to anthracnose and mango, hoppers. Out of the 175 insect pests (Butani 1979) recorded infesting mango, hoppers are most important affecting fruit production. The most damaging species are *Amritodus atkinsoni* (Lethierry) and *Idioscopus clypealis* (Lethierry). The hoppers breed only in the new young leaves or in the inflorescence and during the rest of the year, they rest in the crevices in the bark of trunk and large limbs particulary on the lower side in shady areas. Considering this behaviour of the hopper, an attempt has been made to check its population by destroying the resting adults so that these do not migrate to fresh growth and affect fruiting. Carbaryl has been reported to be effective against mango hopper (Sathianandan *et al.* 1972, Singh *et al.* 1974).

Consequently, carbaryl 0.1% was sprayed on the trunks and limbs of 248 mango trees in an area of 3.55 hectares at Anand campus of Gujarat Agricultural University, Anand. The hopper population on the tree trunks and limbs was recorded regularly by taking 5 sweeps with a hand net from each of 20 out of 248 trees. Similarly, pupulation of mango hoppers was recorded at regular intervals from 20 out of 82 trees in 1.5 hectare orchard located at about 500 meters away kept as control where no pesticide was applied. The population in both the orchards was recorded regularly and pesticide applications were made in the treatment block as and when necessary but before the trees put out fresh growth or inflorescence. The experiment was started in January 1981 and was continued until April 1983.

The results presented in Table-1 show that consistently high population of hoppers was recorded on the trunk than on the limbs. It is also seen that spraying the tree trunks was required to be done only twice, once in December or January preceding the development of the inflorescence and again in June-July preceding the development of fresh vegetative growth. With these two rounds of appropriately timed sprays of carbaryl, it is seen that the hopper population could be managed very effectively at subeconomic level.

An unseasonal cyclone with speed of 90 k.m./hour during second week of November 1982, alongwith heavy rains (254 mm) affected the hopper population in mango orchards as seen from the data in Table-1. The hoppers were not seen until February 1983. They, however, built up their population in the first week of April, 1983, (32.72/ sweep) after the flowering season of January-February 1983. One extra round of carbaryl applied on 10-4-83 reduced the hopper count from 16.07 to 7.69 on the

TABLE 1

Average number of mango hoppers per sweep in treated and untreated orchards.

Sr. No.	Date of observations	Treated orchards		Control orchards	
		Trunk	Limb	Trunk	Limb
1	2	3	4	5	6
1.	13-1-81	0.19	1.15	0.52	1.86
	27-1-81	Carbaryl spray			
2.	28-1-81	0.01	0.14	0.55	6.98
3.	3-2-81	0.0	0.02	0.64	8.06
4.	18-2-81	0.27	0.84	0.79	6.46
5.	5-3-81	0.49	1.42	1.28	7.09
6.	2-4-81	8.36	1.17	42.25	5.42
7.	16-4-81	12.26	0.99	55.43	4.21
8.	2-5-81	12.04	1.07	50.63	4.91
9.	1-6-81	11.51	1.44	47.70	5.34
10.	23-6-81	9.96	1.70	48.73	5.38
11.	3-7-81	7.87	2.60	42.44	6.73
	4-7-81	Carbaryl spray			
12.	4-7-81	0.15	0.32	41.20	7.22
13.	20-7-81	0.22	0.31	22.78	13.90
14.	4-8-81	0.35	0.38	25.36	11.91
15.	25-8-81	0.82	0.87	22.53	14.92
16.	16-9-81	1.38	1.58	23.03	14.07
17.	20-10-81	2.37	1.61	20.99	11.71
18.	6-11-81	1.89	1.04	15.10	9.54
19.	23-11-81	2.07	1.19	12.67	8.75
20.	23-12-81	1.54	1.04	9.67	6.70
	24-12-81	Carbaryl spray			
21.	26-12-81	0.32	0.25	7.19	6.99
22.	2-1-82	0.18	0.47	3.61	8.40
23.	17-1-82	0.21	0.66	2.05	9.21
24.	2-2-82	0.22	0.65	1.74	9.18
25.	26-2-82	0.43	0.96	0.99	10.18
26.	15-3-82	0.70	1.02	10.56	10.51
27.	3-4-82	5.77	0.87	16.85	6.88
28.	19-4-82	7.43	0.97	17.26	7.11
29.	26-4-82	7.80	1.46	17.95	7.62
30.	1-6-82	13.45	1.54	57.31	8.06
	3-6-82	Carbaryl spray			
31.	5-6-82	0.57	0.27	55.40	10.62
32.	10-6-82	0.66	0.28	46.86	9.37
33.	23-6-82	0.75	0.57	41.32	8.07
34.	22-7-82	1.50	0.58	31.58	8.56
35.	26-7-82	1.17	0.68	30.14	9.46

1	2	3	4	5	6
36.	10-8-82	1.23	0.84	27.26	10.91
37.	25-8-82	1.04	0.93	25.23	11.43
38.	10-9-82	0.95	1.02	22.54	13.70
39.	25-9-82	1.19	1.16	22.02	13.04
40.	13-10-82	14.69	5.06	25.44	13.44
41.	27-11-82	3.87	3.86	3.34	3.47
42.	6-1-83	2.81	3.87	3.58	5.87
		18-1-83	Carbaryl spray		
43.	20-1-83	1.28	1.04	2.47	3.38
44.	8-2-83	1.09	0.87	3.53	5.31
45.	4-3-83	1.28	0.97	8.30	7.10
46.	8-4-83	16.07	15.24	29.59	19.94
		10-4-83	Carbaryl spray		
47.	11-4-83	7.69	8.17	32.72	23.23

trunk and from 15.24 to 8.17 on the limbs. The population in the control plot remained very high during April 1983.

Thus, the experiment conducted for over two years in a large well established orchard with similar large orchard kept as control, we could keep the mango hopper population well below the economic injury level with only two rounds of a pesticide applied on the tree trunks and large limbs before the trees put out fresh growth or inflorescence.

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