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EVALUATION OF DIFFERENT INSECTICIDES FOR CONTROL OF MANGO HOPPERS IN MANGO

S. Handa

CCS HAU Research Station,
Buria-135 001,Haryana,India

ABSTRACT

Among the different traditional and synthetic pyrethriods evaluated for control of mango-hoppers for three years during 2004-06, synthetic pyrethriods, cypermethrin and fenvalerate proved better in reducing the pest population more than 89% for upto 10 days followed by quinalphos, carbaryl, endosulfan, monocrotophos and dimethoate with pest reduction ranging between 78.3 to 60.6%.

Mango, the king of fruits is one of the ancient fruits of Indian origin. India accounts to nearly 80 per cent of world's mango production and exports substantial quantities. Apart from other factors, production and quality is hampered due to attack of 175 species of insect-pests (Butani,1979). Among these, mango hoppers are the most serious. The most damaging species in north India are *Idioscopus clypealis* (Leithierry) and *Amaritodus atkinsoni* (Leitherry). Both nymphs and adults cause damage by egg laying in florets and suck sap from tender vegetative and reproductive parts resulting in withering, wilting and drying of these parts (Atwal,1976 and Butani,1979). There are two generations in year, i.e. **spring brood** which occurs in blossoming (February-April) is more destructive than **summer brood** (June - August) as feeding on inflorescence leads to reduction of fruit set and premature fruit fall. Cheema *et al*. (1954) and Gangolly *et al.* (1957) reported the loss to the tune of 25-60% but severe attack may lead to total failure of crop. Mango hoppers also exude honey dew giving a glazed and oily appearance to foliage and encouraging growth of sooty moulds on dorsal surface of leaves, branches and even fruits which interfere with photosynthetic activity of plant reducing vigour of tree. Keeping in view the economic importance of crop and pest , field trial was conducted to evaluate the efficacy of various traditional and synthetic insecticides for control of mango hoppers.

The trials were conducted at CCS HAU Regional Research Station Buria, Yamunanagar, Haryana on langra variety of mango for three years during 2004 to 2006. The trees were 15 years old, spaced 10m apart. During March, when mango trees were at flowering stage and pest population was high, efficacy of different traditional and synthetic insecticides (Table 1) was tested against mango hoppers. Plants sprayed with water served as control. Each treatment was replicated three times in randomised block design and one tree served as one replication. The population of both nymphs and adults was recorded from eight inflorescence per tree (two from each geographical direction) one day before spraying as pre-treatment. Post-treatment observations were recorded. 1,3,7 and 10 days after spraying. The relative efficacy of each treatment was judged on the basis of per cent pest reduction. The data were analysed statistically.

The observations revealed that all insecticides proved significantly superior over control in reducing the pest population (Table 1). After one day of the spray, cypermethrin and fenvalerate recorded the highest reduction (93.2 and 89.8 %) in pest population respectively, followed by quinalphos (75.7%), carbaryl (73.3%), endosulfan (70.1%), monocrophos (63.5%) and dimethoate (52.7%). In the control there was no reduction in the population, rather the population increased by 8.4%.

After 3 days of the spray, pest reduction showed increasing trend almost in the similar

Table 1. Efficacy of different insecticides for control of mango hopper during 2004- 2006 (Three years pooled data)

Insecticide	Conc.%	Per cent reduction in population after days of spray				Mean	Approx cost/ 500 L. Rs.
		1	3	7	10		
Cypermethrin 10EC	0.006	93.2 (74.8)	95.3 (77.4)	94.6 (76.5)	87.9 (69.6)	92.7 (74.3)	55
Fenvalerate 20 EC	0.006	89.8 (71.3)	92.2 (73.7)	92.7 (74.3)	84.5 (66.8)	89.8 (71.3)	35
Quinalphos 25 EC	0.05	75.7 (60.4)	80.7 (63.9)	82.9 (65.5)	74.1 (59.4)	78.3 (62.2)	375
Carbaryl 50 W.P	0.15	73.3 (58.8)	78.0 (62.0)	78.4 (62.3)	69.8 (56.6)	74.8 (59.8)	600
Endosulfan 35 EC	0.07	70.1 (56.8)	75.6 (60.4)	74.5 (59.6)	69.2 (56.2)	72.3 (58.2)	220
Monocrotophos 40 EC	0.05	63.5 (52.8)	73.7 (59.1)	79.2 (62.8)	66.7 (54.7)	70.7 (57.2)	175
Dimethoote 30 EC	0.05	52.7 (46.5)	63.2 (52.6)	65.0 (53.7)	61.7 (45.9)	60.6 (45.3)	195
Control	Water spray	+ 8.4 (16.8)	+14.9 (22.7)	+19.6 (26.2)	+22.6 (28.3)	+16.3 (23.7)	—
CD at 5%		(10.4)	(12.5)	(6.1)	(8.5)	(9.3)	—

Figures in parentheses are angular transformed values.

order. In synthetic pyrethroids, the reduction was above 90% whereas in others it ranged between 80.7 and 63.2% while in control the population increased by 14.9%. After 7 days of the spray, in general, a slight increase in reduction was recorded except in a few treatments while in untreated control the increase was 19.6%. However, 10 days after the spray the pest population started increasing again.

On the basis of over all performance, cypermethrin and fenvalerate proved better than conventional insecticides in all the post-treatment counts followed quinalphos, carbaryl, endosulfan, monocrotophos and dimethoate.

Sathianandan *et al.* (1972) and Singh (1974) reported carbaryl to be effective against mango hopper. Singh (1978) also recommended carbaryl alongwith monocrotophos and phosphamidon whereas Butani (1979) recommended phosphamidon and monocrotophos. Endosulfan and monocrotophos were reported to be effective against mango hoppers by many earlier workers (Tandon and Lal, 1979; Yazdani and Mehto,1980; Dakshinamurthi, 1984; Shukla and Parsad,1984; Kumar *et al*., 1985; Nachiappan and Baskaran, 1986; Chandrasekran *et al.*,1988 and Khangura *et al*., 1993). In the present study, however, synthetic pyrethriods, *viz.* cypermethrin and fenvalerate were found more effective resulting in 92.7 and 89.8% reduction in pest population respectively. Quinalphos, carbaryl endosulfan and monocrotophos were also quite effective but significantly lower than synthetic pyrethriods. Dimethoate was the least effective. All the insecticides remained effective for upto 7 days.

The cost of application of the respective insecticide (per 500 L water) was worked out to be Rs. 55,35,375,600,220,175 and 195 respectively. Therefore, considering the effectiveness and economics of insecticides usage, the order of effectiveness may be catogorised as fenvalerate, cypermethrin, monocrotophos, endosulfan, quinalphos and

carbaryl. As the pest is active during flowering stage repeat spray was, therefore, necessory after 15 - 20 days to avoid yield loss and damage to plant growth.

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