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Insecticidal Control Trials Against the Oriental Fruitfly, *Dacus dorsalis* Hendel on Mango in Tamil Nadu

by

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Introduction : Among the various insects affecting mango, the oriental fruitfly, *Dacus dorsalis* H., is a serious pest. The fly makes a dark puncture during oviposition and the maggots that hatch out from the eggs feed on the pulp of the fruit for a few days and thus cause a brown rotten patch on the fruit surface. The fruits eventually fall and the maggots come out of the fruits to pupate in the soil. Their attack not only reduces the yield but also affects the quality of fruits. Ayyar (1940) recommended plant sanitation in orchards by destruction of fallen and badly infested fruits as the most important measure against the fruitfly. Giang *et al* (1956) reported that DDVP is very effective against the pest in Hawaii and its residues virtually disappear in 72 hours. Narayanan and Batra (1960) advocated spraying of diesel oil emulsion (diesel oil one gallon plus soft soap one pound plus water one gallon, diluted eight times) during the night and cooler hours of the morning when the flies congregate in large numbers.

Field trials were undertaken at the Model Orchard cum Nursery, Thimmapuram and the Fruit Research Station, Kanyakumari on *Neelum* and *Bangalora* varieties during 1964-67 with a view to evaluate the efficacy of

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modern synthetic insecticides in controlling the pest and the results are presented in this paper.

Materials and Methods: During the years 1964-67 seven field trials, four on *Neelum* variety and three on *Bangalora* variety were conducted as detailed in the Table for the control of the mango fruitfly. The treatments were randomised and replicated four times having one tree for each replication. A total of three rounds of spraying was given, commencing the first round of spraying 1½ months after flowering, synchronising with the marble stage of the fruit and the egg laying of the fruitfly, followed by two more sprayings at monthly intervals. The entire foliage, branches, fruits, trunk and the soil around the tree were treated with a rocker type of sprayer using 3 to 4 gallons of spray fluid per tree. At the time of fruit maturity one hundred fruits were harvested at random for each treatment at the rate of twenty five fruits per replication and the incidence of fruitfly assessed. The data were statistically analysed and are presented in Table.

TABLE. Effect of insecticidal treatments on the infestation of fruitflies on mango

Treatments	Fruitfly incidence (Transformed value) <i>Neelum</i> Variety				<i>Bangalora</i> Variety			Cost of insecticide per round Rs. P.
	Model Orchard cum Nursery, Thimmapuram		Fruit Research Station, Kanyakumari	Model Orchard cum Nursery Thimmapuram				
	I 1964	II 1966		III 1967	IV 1967	V 1964	VI 1965	
Fenthion 0.1%	5.75	12.72	15.17	12.72	2.88	—	—	Not quoted by the firm 1-52
Phosphamidan 0.1%	10.82	21.92	21.13	—	6.98	—	—	
Malathion 0.1%+ DDT 0.1%	2.87	5.75	15.17	—	—	—	—	0-48
Malathion 0.1%+ Endrin 0.02%	—	—	—	—	5.75	12.72	5.75	0-79
Thiometon 0.1%	12.72	16.10	16.40	—	—	—	—	1-07
Malathion 0.1%	—	—	—	15.17	—	—	—	0-36
Endrin 0.02%	—	—	—	19.32	—	—	—	0-22
DDT 0.1%	—	—	—	17.95	—	—	—	0-13
Carbaryl 0.1%	—	—	—	—	8.61	23.67	9.85	0-51
Dimethoate 0.1%	—	—	—	—	—	27.10	13.95	1-14
Metacid combi 0.1%	—	—	—	—	—	29.95	13.95	0-96
Control	23.52	29.90	33.70	31.85	26.01	36.77	36.80	
'F' Test significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
S.E	2.58	4.68	1.38	1.67	2.61	1.84	2.64	
C.D	7.95	14.43	4.06	5.17	8.04	5.68	8.14	

Results and Discussion: It may be observed that the treatments, malathion 0.1 % in combination with either DDT 0.1 % or endrin 0.02 % or fenthion 0.1 % alone, have recorded the minimum incidence of the fruitfly.

Armitage (1949) recommended repeated application of DDT against the fruitfly in Hawaii. Carter (1950) reported that EPN, dieldrin, parathion and DDT were the best insecticides to leave toxic deposits in the laboratory tests but gave less than 75 % control in small plot tests. Dieldrin and aldrin were ten times as effective as DDT in aerosol fogs, lindane and chlordane 4 to 5 times effective. Steiner (1952), reports that in Hawaii, in small plot tests, bait sprays containing protein hydrolysate, sugar and parathion gave excellent control of *Dacus ferrugeneus dorsalis* and DDT gave 82 % control when applied at 1.5 pound per acre in a wettable power spray. Tamashiro and Sherman (1955) observed that aldrin, isodrin, dieldrin, endrin, chlordane and BHC killed both the parasites and fruitfly larvae, pupae or fully developed adult within puparia or emerging fruitfly adults. Dimethoate 0.06 % has been reported to be effective against eggs and maggots of *Dacus oleae* (Melis, 1957). Jotwani (1967) reported that the combination of DDT and malathion produced synergistic effect and was found to be five times more effective than the formulations when tried alone against *Galerucella birmanica* J.

In the present studies also it may be observed that sprays of DDT 0.1 % have recorded less incidence of the pest next to combination of malathion plus DDT and fenthion when compared with other insecticides. Dimethoate 0.1 % does not seem to afford good control. The combination of malathion 0.1 % plus DDT 0.1 % had been found to be five to six times more effective in minimising the fruitfly incidence than malathion or DDT tried alone which finding is in conformity with the report of Jotwani (1967) on another pest. It may be concluded that considering the effectiveness, cheapness and low mammalian toxicity, the combination spray of malathion 0.1 % plus DDT 0.1 % given thrice, commencing the first round 1½ months after flowering followed by two more rounds at monthly intervals may be advantageously recommended for the control of mango fruitfly.

Summary: A total of seven field trials was undertaken at the Model Orchard cum Nursery, Thimmapuram and the Fruit Research Station, Kanyakumari on *Neelum* and *Bangalora* varieties during 1964-67 with various insecticides against the fruitfly. It was noted that three rounds malathion 0.1 % plus DDT 0.1 % spray at monthly intervals commencing the first round 1½ months after flowering minimised the incidence of fruitfly.

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Resistance of Castor to Lepidopterous Insects with Reference to
the Effect of Food Plant of *Achoea janata* Guen. on its
Braconid Parasite, *Microplitis Ophiusae* R.

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Introduction: Considerable progress has been made in the recent past in the study of insect resistance in crop plants, and varieties resistant to pests have been evolved. Castor is subjected to the severe attack by many insect pests particularly the semilooper, *Achoea janata* L., and the shoot and capsule borer, *Dichocrocis punctiferalis* Guen. year after year in several parts of the country. Even though effective chemical method of control is available against many of these pests, the importance of evolution of pest-resistant varieties is increasingly felt in recent years. Castor has been studied by different authors for its resistance to many pests. Detailed investigations in screening large number of castor varieties for resistance to the jassid *Empoasca flavescens* (F) were undertaken by Jayaraj (1966-a, 1967-a). Preliminary observations were made on their resistance to the shoot and capsule borer *Dichocrocis punctiferalis* Guen. (Basu 1947, David *et al* 1964, Sulochanabai *et al* 1968), the European corn borer *Ostrinia nubilalis* (Hubn.) (Kittock and Williams 1963), the whitefly *Trialeurodes ricini* Misra (David and Radha 1964), and the red spider mite *Tetranychus telarius* (L) (Chandrasekharan