

Investigations on the Insecticidal Control of the Phyllody Disease of Sesamum

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Field trials with insecticides were conducted for the control of the phyllody disease of sesamum. No significant control of the disease was obtained with granular insecticides applied in soil. Five spray applications of sevithion (carbaryl 40 per cent + methyl parathion 10 per cent) at 1½ kg of the product per ha or monocrotophos 0.025% were found to be significantly superior to sprays of dimethoate 0.05%, methyl demeton 0.025%, fenthion 0.1% and endosulfan 0.07%. A heavy build up of aphids (*Aphis gossypii* G.) was however, experienced in the Sevithion treated plots towards the late stage of the crop causing substantial loss in yield. Sevithion, monocrotophos and endosulfan were the best for affording protection from the shoot webber-cum-capsule borer. Significantly higher yield was obtained with monocrotophos.

Phyllody of sesamum is a very serious mycoplasma disease capable of causing heavy loss in yield. This disease is transmitted by the jassid vector, *Orosius albicinctus* Distant (Vasudeva 1955, Vasudeva and Sahambi, 1957 and Ghauri, 1966). Cousin *et al.* (1970) proved that the disease causing agent is a mycoplasma-like organism. Tandon and Banerjee (1968) found that application of different insecticides except methyl demeton was effective against phyllody. Two soil applications of phorate granules combined with endrin sprays have been recommended by them for the control of phyllody and leaf curl disease. Bindra and Joginder Singh (1970) found dimethoate 0.08 per cent and carbaryl 0.2 per cent to be effective in killing the insect for five days.

Field experiments for the control of the disease by the use of insecticides have been conducted from 1972 to 1975 and the results are reported in this article.

MATERIALS AND METHODS

Trials were conducted under randomised and replicated design during the *Rabi* and *Kharif* seasons from 1972 to 1975. The plot size varied from 5.4 m² to 12.96 m² (Net) in the different seasons, the smaller size having been adopted for the *Rabi* season. The treatments were replicated three to four times conforming to the requirements of statistics. The variety TMV 3 was sown for the trials until *Rabi* 1973 and later KRR 2 a more susceptible variety was chosen. Granules of phorate, aldicarb, disulfoton,

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carbofuran etc. all at 1.25 kg a. i./ha were applied as side dressing 15 days after sowing until *Rabi* 1974. In the trials in 1973 and *Rabi* 1974, the granular applications were followed by two spray applications at the commencement of flowering and two weeks hence, the insecticide chosen for the spraying being endrin 0.2 kg a. i./ha for aldicarb plots, carbaryl 1 kg a. i./ha for disulfoton plots and dicrotophos 0.75 kg. a. i./ha for carbofuran plots. The granules were applied in furrows at sowing in the trial in *Khariff* 1974 and besides, seed treatment with carbofuran wettable powder at 5 per cent concentration was also tried. Nuvacron (monocrotophos) 40 E.C. was sprayed at 1250 ml/ha at the 30th, 45th, and 60th days after sowing in all the plots except under control during this season. As there were no conclusive findings in regard to the control of phyllody in all the six trials from 1972 to 1974, the granular applications were discontinued during 1975 and instead, the insecticides dimethoate 0.05 per cent, monocrotophos 0.05 per cent, endosulfan 0.07 per cent, fenthion 0.1 per cent, methyl demeton 0.025 per cent and sevithion (carbaryl 40 per cent + methyl parathion 10 per cent and inert materials 50 per cent) 1½ kg of the product/ha were tried in five rounds of spray applications at an interval of 10 days commencing from 21 days after sowing. The quantity of spray fluid used was 500 litres per hectare for the first three rounds and 750 lit per ha for the last two rounds of applications.

The results were assessed by recording the number of infected plants

from out of the total population per plot about two weeks prior to harvest. Counts of shoot webber and aphid infestation were also made in *Rabi* and *Khariff* 1975. For shoot webber infestation, the number of attacked plants out of the total population of plants per plot was recorded 50 to 60 days after sowing and for capsule damage, the number affected out of the total number of pods on the central shoot of 10 random plants per plot was counted. For damage by aphids the percentage of plants that died up due to the severe infestation by this pest in each plot was assessed.

RESULTS AND DISCUSSION

The results obtained are summarized in Table I and II. The incidence of phyllody was negligibly low in the trials conducted in *Khariff* 1972 and 1974 while in the remaining four trials with granules the incidence of the disease ranged from 6.5 to 21.8 per cent in the untreated plots. No significant control of the disease was obtained in these trials and there was no significant increase in yield also. The trial with spray applications alone in *Rabi* 1975 showed that dimethoate, Sevithion, monocrotophos and fenthion with 0.55 to 5.17 per cent infection were on par and superior to endosulfan, methyl demeton and control with 8.39 to 9.77 per cent phyllody infection. In respect of control of shoot webber, Sevithion with 15.8% of plants attacked, monocrotophos (20.9%) and endosulfan (25.0%) were the most effective against 34.0 to 41.5 per cent in the remaining treatments and control. The

TABLE I. Incidence of phyllody and yield in granular insecticides trials in Rabi and Khariff seasons from 1972 to 1974

Treatment	Phorate 1.25 kg a.i/ha.		Aldicarb 1.25 kg a.i/ha.		Disulfoton 1.25 kg a.i/ha.		Carbofuran 1.25 kg a.i/ha.		Carbofuran Seed treat- ment (5%)		Mefosulfan 1.25 kg a.i/ha.(5%)		Control	
	Mean% phyllody infection	Yield per ha (kg)	Mean% phyllody	Yield per ha (kg)	Mean% phyllody	Yield per ha (kg)	Mean% phyllody	Yield per ha (kg)	Mean% phyllody	Yield per ha (kg)	Mean% phyllody	Yield per ha (kg)	Mean% phyllody	Yield per ha (kg)
Rabi 1972	4.1	428	8.8	586	7.1	403	N.T.	N.T.	7.2	474	6.5	537		
*Khariff 1972	1.42	266	1.72	314	1.38	307	2.45	355	N.T.	1.68	257	1.1	280	
Rabi 1973	2.60	574	0	633	1.70	549	1.90	562	N.T.	8.62	397	5.4	509	
@ Khariff 1973@	16.80	407	17.6	375	13.4	433	16.6	407	N.T.	N.T.	21.8	317		
Rabi 1974@	4.9	476	6.3	636	4.8	567	4.6	535	N.T.	N.T.	7.4	495		
*Khariff 1974(b)	1.1	353	1.9	653	1.8	654	2.1	610	1.8	530	N.T.	0.9	500	

Note: The results were not significant in all the seasons.

* Incidence of phyllody was very low in these trials.

@ Phorate granule was followed by two sprays of endrin, aldicarb by dimethoate, disulfoton by carbaryl, Carbofuran by dicrotophos at commencement of flowering and 2 weeks hence.

(b) All the treatments other than control were followed by three sprayings with monocrotophos at the 30th, 45th and 60th days after sowing.

N. T.: Not tried.

yield differences were however, not significant although the yield was higher in Sevithion, endosulfan and monocrotophos. During the *khariff* season of 1975, a very heavy incidence of phyllody was recorded. The earliest infestation of phyllody symptoms was observed 53 days after sowing in this season as against 70 days after sowing in *Rabi* 1975. Sevithion and monocrotophos with 14.15 and 26.97 per cent infection respectively were superior to the treatments and control with 42.75 to 63.95 per cent infection. Dimethoate which was found to be effi-

acious in the previous season proved to be ineffective under the heavy incidence conditions during this season. Counts of vector population were also attempted, but was found to be only stray. Sellammal Murugesan *et al.* (1973) have reported that the leaf hopper population recorded with in the field has no significant influence on the incidence of phyllody. In the present investigation too, no correlation between the vector population and incidence of the disease was possible as, despite a heavy incidence of the disease, only stray numbers of the vector were evi-

TABLE II. Incidence of phyllody and pests and yield in spraying trials

Treatments	Rabi 1975 (Sown in Feb. 75) Mean percentage attack						Kharif 1975 (Sown in Oct. '75) Mean percentage attack									
	Phyllody plants		Shoot webber attacked plants		Yield per ha. (kg)	Percentage increase over control	Phyllody affected plants		Shoot Webber (plants)		Shoot webber (Capsules)		Aphids (Plants)		Yield per ha. (i)	Percentage increase over control
	AV	TV	AV	TV			AV	TV	AV	TV	AV	TV	AV	TV		
Dimethoate 0.05%	0.55	5.37	41.5	39.99	437	27	50.33	45.20	22.52	27.56	2.26	28.20	1.6	5.06	45	15
Fenthion 0.1%	2.30	8.60	35.0	35.64	413	20	50.26	43.65	6.37	12.98	19.4	25.98	9.0	13.72	74	90
Sevithion 1kg/ha	3.44	10.42	15.8	22.87	543	58	14.15	22.03	1.09	3.03	5.0	12.63	44.1	41.42	59	51
Monocrotophos 0.5%	5.17	11.81	20.9	28.82	452	32	26.97	30.77	6.8	14.74	9.2	17.48	3.3	9.11	129	231
Methyl demeton 0.025%	8.39	16.62	37.2	37.41	346	1	42.75	40.80	26.76	31.03	24.0	29.04	0	0.37	59	51
Endosulfan 0.07%	8.70	16.39	25.3	30.14	472	38	47.08	40.58	2.73	8.63	10.1	18.4	2.2	6.15	83	112
Control	9.77	17.80	40.4	39.40	343	93.95	53.38	27.51	30.88	42.2	40.50	15.1	21.02	39	39	39
CD (P=0.05)	6.79	7.14	NS	7.14	NS	7.59	7.09	5.94	13.49	23.4						

A. V. = Actual Value T. V. = Transformed value . N. S. = Not Significant