

CONTROL OF THE INSECT PESTS AFFECTING COWPEA *VIGNA SINENSIS*

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The cow pea is an important vegetable grown all over Kerala. The pea aphid *Aphis craccivora* and various pod borers are the serious pests in the early and fruiting stages of the crop respectively. Vislakshy *et al* (1976) found in a pot trial that the application of phorate granules along with the seeds at the time of planting @ 2 kg ai/ha was an effective and safe method for protecting the crop from the infestation by *A. craccivora*. Das *et al* (1975) had studied the persistent toxicity of phorate, carbofuran, methosfolan and disulfoton to the pea aphid when applied along with seeds, sown in different soil types in pots, and found that disulfoton was most effective in controlling the pest in all types of soil. The present paper embodies the results of field experiments conducted at the College of Agriculture, Vellayani for evaluating some insecticide granules and sprays in controlling pea aphid and pod borers respectively.

Materials and methods

A high yielding cultivar 'Philippines' was used in these experiments. The insecticide granules and contact sprays used are detailed in Tables I and 2. The plants were raised in 15 x 1.5 m plots laid out in the College Farm adopting a Randomised Block Design. The soil of the experimental area was of the red type. The insecticide granules (vide Table-1) were applied at different doses in the soil along with the seed at the time of sowing. The treatments including control were replicated thrice. Watering and manuring of the crop were done in accordance with the package of practices in vogue.

For studying the persistent toxicity of insecticides to *A. craccivora* 10 gramme samples of apical portions of the plants under various treatments were collected at weekly intervals and put in chimneys closed at both ends with muslin cloth and placed over a glass plate. Fifteen insects of uniform age were introduced in each chimney and their mortality was recorded at the end of 48 hours. The persistent toxicity was assessed in terms of PT indices following the method adopted by Pradhan (1967).

For controlling the pod borers insecticides (vide Table 2) were sprayed on a need basis commencing from the time of flowering. Disulfoton @ 1 kg ai/ha was applied in all the plots (excluding the control) at the time of sowing. This experiment also was laid out adopting a Randomised Block Design, each treatment being replicated thrice. The yield data under different treatments, for

Table 1

Persistent toxicity of different insecticide granules to the pea aphid *A. craccivora*

Treatments		corrected percentage mortality at the end of (days)					PT index		
		7	14	21	28	35			
Thimet	0.5 kg ai/ha	59	72	39	21	10	35	40.20	1407
do	1.0 do	86	48	61	28	16	35	47.80	1673
do	2.0 do	86	78	35	53	48	35	60.00	2100
Disulfotan	0.5 do	86	86	35	30	6	35	48.60	1701'
do	1.0 do	86	86	65	58	49	35	68.80	2408
do	2.0 do	86	86	77	58	58	35	73.00	2555
Mehospfolan	0.5 do	67	13	22	49	12	35	32.60	1141
do	1.0 do	69	30	29	57	38	35	43.20	1512
do	2.0 do	75	38	41	53	40	35	49.40	1729
Carbofuran	0.25 do	64	30	29	75	32	35	46.00	1729
do	0.5 do	72	99	45	21	24	35	36.80	1288
do	1.0 do	86	65	71	60	56	35	67.60	2366

P=period for which toxicity persisted T=Average percentage mortality

various harvests, were recorded noting the number and weight of healthy and infested pods. The yield in two plots were missing due to the death of plants and hence the data were estimated by iteration and the treatments were compared with students 't' test.

Results and discussion

The persistent toxicity of various insecticide granules is presented in Table 1. Disulfotan was found to be most effective at all the three levels tried. It was followed by carbofuran, thimet and mephosfolan at the highest dose; thimet,, mephosfolan and carbofuran at the middle dose and by carbofuran, thimet and mephosfolan at the lowest dose. The higher efficacy of disulfotan was also reported by Das *et al* (1975). The doses of 1 and 2 kg of disulfotan were giving almost similar mortality upto the end of 4 weeks after application. In the fifth week also mortality of the aphids in these treatments were seen very close to each other viz. 49 and 58 per cent respectively. Hence the application of disulfotan @ 1 kg ai/ha may be considered as an effective and economic method for controlling the pea aphid. The toxicity of all the insecticides persisted even beyond 5 weeks after application.

Table 2

Effect of different insecticides sprayed on **cowpea** on the incidence of pod borers and on the yield

Insecticides and dose	Percentage* of borer attack	Total* yield (kg/ha)	Yield increase over control	Prices of produce at market rate (Rs/kg)	Cost of pest control	Benefit/cost	
Fenitrothion	0.05 %	16.46	5088	1920	1920	246 00	4.2
Leptophos	0.05%	19.74	4555	1367	1387	467.00	2.1
Fenthion	0.05%	12.98	6844	3676	3676	462.00	5.5
Quinalphos	0.05%	17.70	5031	1863	1863	654 00	2.2
Phosalone	0.08%	19.51	4857	1689	1689	516.00	2.2
Carbaryl	0.2 %	15.94	5120	1952	1952	438.00	3.0
Monocrotophos	0.04%	15.71	5755	2587	2587	515.00	3.6
Control		23.88	3168				

* Significant in 't' test

cost of labour included is for one granule application (3 labourers/hectare) and 3 sprayings (15 labourers/hectare) at **Rs. 10/-** per labourer and the cost of insecticides taken is at the existing market rates.

The spraying of different insecticides commencing from flowering stage reduced the borer incidence to various levels (vide Table 2). The incidence in plots treated with fenthion was significantly lower than that of control. The efficacy of other insecticides was in the following descending order: monocrotophos, carbaryl, fenthion, quinalphos, phosalone and leptophos. They were found on par with control in statistical analysis of the data. The extent of borer incidence and the yield were seen negatively correlated. The efficacy of various insecticides in increasing the yield was in the following descending order: fenthion, monocrotophos, carbaryl, fenitrothion, quinalphos, phosalone and leptophos. The yield under various treatments (except leptophos) were significantly superior to that of control and they were on par. On the benefit cost ratio basis the above effective insecticides could be ranked as fenthion > fenitrothion > monocrotophos > carbaryl > phosalone > quinalphos.

Summary

In a field experiment conducted in the red soil of Agricultural College Farm, Vellayani applying thimet, disulfoton, mephosfolan and carbofuron granules at three different levels, applied at the time of sowing, disulfoton

at 1 kg ai/ha was found an effective and economic method for controlling pea aphid upto 5 weeks after sowing. In another field experiment it was observed that spraying of different insecticides commencing from the time of flowering along with one application of disulfotam granules at the rate of 1 kg ai/ha at the time of sowing reduced the incidence of pea aphid and pod borers and increased the yield significantly. On a benefit cost ratio basis the effective insecticides could be ranked as follows: fenithion > fenitrothion > monocrotophos > carbaryl > phosalone > quinalphos.

സംഗ്രഹം

തിമൊറ്റ, ഡൈസൾഫോളാൻ, മിഫോസഫോളാൻ, കാർബോഫുന്റാൻ എന്നീ തരി രൂപത്തിലുള്ള കീടനാശിനികൾ വിവിധ അളവുകളിൽ വിതറിയിട്ടുണ്ടാകുന്നതിനോടൊപ്പം മണ്ണിൽ ചേർത്തു നടത്തിയ പരീക്ഷണത്തിൽ ഡൈസൾഫോളാൻ I. കി.ഗ്രാം വിഷാംശം ഹെക്ടറിന് കിട്ടുന്ന അളവിൽ ചേർന്നതു് പയറിനെ ബാധിക്കുന്ന മുഞ്ഞയെ നിയന്ത്രിക്കാൻ പറ്റിയതാണെന്നു തെളിഞ്ഞു. മറ്റൊരു പരീക്ഷണത്തിൽ ഡൈസൾഫോളാൻ ചേർത്ത ശേഷം പൂക്കൾ വന്നു തുടങ്ങുമ്പോൾ കീടനാശിനികൾ തളിച്ചാൽ കായ്തുരുപ്പൻ കീടങ്ങളെ നിയന്ത്രിക്കാനും വിളവു ഗണ്യമായി വർദ്ധിപ്പിക്കുവാനും സാധിക്കുമെന്നു കണ്ടു. അറ്റാദായത്തിന്റെ അടിസ്ഥാനത്തിൽ പരീക്ഷണ വിധേയമാക്കിയ കീടനാശിനികളിൽ പ്രയോജനപ്രദമായവയെ താഴെ കാണും. പ്രകാരം ക്രമീകരിക്കാം. ഫെന്തിയോൺ > ഫെന്തിട്രോത്ത്യോൺ > മോണോക്രോട്ടോഫോസ് > കാർബാറിൽ > ഫോസലോൺ > ക്വിനാൽഫോസ്.

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