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EVALUATION OF INSECTICIDES AND MOULT INHIBITOR IN THE CONTROL OF GROUNDNUT LEAF MINER *Aproaerema Modicella* DEV.

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ABSTRACT

In the preliminary trial, spraying diflubenzuran (Dimilin) 25 WP @ 100 g a.i./ha on groundnut brought 50 per cent reduction in larval and 30% in pupal stages of leaf miner. The order of efficacy in the control of leaf miner and reduction in leaflet damage was decamethrin 0.01% chlorpyriphos 0.05% monocrotyophos 0.05% quinolphos 0.05% diflubenzuran 0.016% dimethoate 0.1% and that of securing higher yield, the order was monocrotophos decamethrin chlorpyriphos dimethoate fenvalerate diflubenzuran. In the confirmatory trial, diflubenzuran 1.6 kg/ha followed by phosalone (750 ml/ha) and chlorpyriphos (2 lit/ha) recorded less leaf miner damage and higher pod yield.

Leaf miner Aproaerema modicella Dev. is an important production constraint pest accounting for huge crop loss. The chitin inhibitor diflubenzuran 1 (4-chlorophenyl)-3 (2,6 - difluprobenzyl) was reported to be effective against *Spodoptera litura* Fabricius on groundnut (Natesan and Balasubramanian, 1980). *Spodoptera littoralis* Fabricius on groundnut (Ascher and Nemny, 1976) and looper, *Pseudoplusia includes* walker on soybean (Turnipseed *et al.* 1974). The chitin inhibitor is safer to biological control agents and non hazardless to man and other animals. It has been evaluated along with other insecticides against leaf miner and results are presented in this paper.

MATERIALS AND METHODS

During Kharif 1985, 14 pairs of 12 m^2 plots with groundnut (CO^1) was choosen and the alternate plots were treated with difluebenzuran 25% wp 100g a.i/ha in a spray volume of 625 lit/ha. When the crop was 60 days old and five days after noticing the emergence of first brood of leaf miner the treatments were given. The data on larval and pupal densities per plant were assessed before and 15 days after treatment by counting their population in the middle one meter row (10 plants) in each plot. The difference between the treated and un-treated plots were compared by paired 't' test.

During 1986 another replicated trial was conducted with nine treatment viz.,

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monocrotophos 0.05%, quninalphos 0.05%, chlorpyriphos 0.05%, dimethoate 0.1%, decamethrin 0.01%, fenvalerate 0.01%, diflucbenzuran 0.016%, carbofuran 1 kg a.i./ha and an untreated check. Carbofuran was applied as basal and the other treatments were given on 30 and 45 days after sowing. The larval density and leaflet damage were assessed on 45th and 60th day after sowing. The per cent control of the pest was worked out for each treatment over the population in the untreated check.

A third trial was laid out during January 1987 involving the treatments diflubenzuran 25 wp at 1.6 kg/ha, chlorpyriphos 2 lit/ha, endosulfan 750 ml/ha, phosalone 750 ml/ha with an untreated check on groundnut (JL 24) the plot size being $40m^2$. The treatments were given on 40th day after sowing. The larval population and leaflet damage before and after treatment on 2, 7, 14 days were assessed. Yield of pods were recorded at harvest.

RESULTS AND DISCUSSION

In Kharif 1985 experiment the larval population did not differ significantly before treatment. But there was significant difference between treatment and untreated plot both in the larval and pupal population. The reduction in density of leaft miner was 50 and 30 per cent for larval and pupal stages respectively (Table 1).

In the second trial conducted during summer 1986, though the per cent control of the pest ranged from 51.4 (diflubenzuran) to 65.2 (dimethoate) on 45th day after sowing but there no significant difference among different treatments. However on 60 days after sowing decamethrin inflicted 85.5% control of

TABLE 1. Efficacy of Diflubenzuran against leaf miner

	Pest Density/Plant			
	Larvae		Pupal	
	Mean	SD	Mean	SD
Pre-treatment				
(a) Diflubenzuran	3.41	± 0.73	1.25	± 0.53
(b) Control	3.32	± 0.45	1.42	± 0.60
(c) Difference (b - c)	0.09	± 0.72	0.17	± 0.35
(d) (t) P = 0.05	0.43^{NS}	-	1.79^{NS}	-
Post-treatment				
(a) Diflubenzuran	1.29	± 0.72	1.43	± 0.62
(b) Control	2.58	± 0.36	2.04	± 0.37
(c) Difference (b-c)	1.29	± 0.71	0.61	± 0.78
(d) 't' p = 0.05	6.79**	-	2.90*	-

@ Mean of 14 plots * Significant 5% level ** Significant at 1% level

larval followed by cholorpyriphos 77.9%, monocrotophos 75%, difluenzuran (72.8%) and dimethoate (72%) which were on par in their efficacy. The effectiveness of chlorpyriphos is in agreement with the findings of Sangappa and Ali (1979). An appraisal of the leaflet damage indicated that dimethoate recorded less damage of 4.6% on 45 DAS which was superior to other treatments but on 60 DAS chlorpyriphos recorded 12.5% damage which was on par with rest of treatments except the untreated check.

In respect of pod yield, monocrotophos registered highest hectare yield of 2317 kg followed by decamethrin and chlorpyriphos each with 2142 kg and dimethoate 2125 kg fenvalerate 2100 kg. The percentage of increase in yield was higher in monocrotophos (52.7) followed by decamethrin and chlorpyriphos (42.2), dimethoate (40.1), fenvalerate (38.4), diflubenzuran (35.7), quinalphos (25.4) and carbofuran (22.5) (Table 2)

In the third experiment all the chemicals were superior to control in reducing the larval and their damage on

TABLE 2. Leaf Miner Damage and Yield (Rabi 1986)

Treatment	Per cent control*		Per cent leaf let damage		Pod yield Kg/ha
	45 DAS	60 DAS	45 DAS	60 DAS	
Decamethrin	59.8 (50.63)	85.5 (67.63)	30.5 (33.50)	16.7 (24.10)	2142
Chlorpyriphos	58.8 (50.04)	77.9 (61.97)	32.2 (34.59)	12.5 (20.74)	2142
Monocrotophos	61.6 (51.72)	75.0 (60.01)	24.3 (29.56)	19.2 (25.98)	23217
Diamethoate	65.2 (53.86)	72.0 (58.07)	4.6 (12.38)	19.5 (26.17)	2125
Quinalphos	60.2 (50.91)	77.9 (61.97)	28.1 (32.01)	17.6 (24.79)	1917
Diflubenzuran	51.4 (45.81)	72.8 (58.55)	32.0 (34.48)	15.4 (23.14)	2058
Fenvalerate	61.3 (51.53)	69.7 (56.62)	27.7 (31.75)	23.7 (29.11)	2100
Carbofuran	57.6 (49.36)	65.0 (53.73)	49.7 (33.05)	23.2 (28.81)	1858
Check	-	-	64.9 (53.73)	62.7 (52.36)	1517
CD (P=0.05)	N.S.	4.72	64.9	6.42	219

* Mean of three replications N.S. = Not Significant
Figures in parantheses are arcsin transformed values

TABLE 3. Efficacy of Diflubenzuran and Insecticides

Treatments	Dose	Live larvae 5 plants	% leaflets affected	Pod yield kg/ha	Increase over control
Diflubenzuran	1.6 kg/ha	6.9	19.8 (26.44)	3756	18.7
Phosalone	750 ml/ha	6.3	19.5 (26.24)	3735	8.6
Chlorpyriphos	2 lit/ha	5.5	19.8 (26.45)	3509	10.9
Endosulfan	750 ml/ha	5.9	19.5 (26.21)	3262	3.1
Control		14.1	42.2 (34.60)	3163	-
C.D. (p = 0.05+)		1.4	3.97	157	

Figures in parentheses are transformed arcsin values

leaflet. Diflubenzuran recorded significantly higher pod yield of 3756 kg/ha followed by phosalone (3735 kg) but they were on a par. The next in the order to record higher yield was chlorpyriphos which was superior to endosulfan (Table 3). The effectiveness of diflubenzuran is in agreement with the findings of Natesan and Balasubramanian (1980).

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