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EFFECT OF NEW INSECTICIDES AGAINST COTTON BOLLWORMS

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ABSTRACT

In field trials conducted for two years, it was found that two new synthetic pyrethroids viz., cyhalothrin at the rate of 0.025 kg a.i./ha and fluvalinate 0.075 kg a.i./ha were equally effective as fenvalerate 0.075 kg a.i./ha against the bollworms on cotton. There was not much difference among the treatments in the yield of seed cotton, though flucythrinate recorded 2033 kg/ha (1985-86) and fenvalerate 1780 kg/ha (1986-87) as against 978 kg/ha in the untreated check respectively.

Sellammal Murugesan et.al. (1979), Balasubramanian et.al. (1980), Somasundaram and Regupathy (1985) reported that the synthetic pyrethroids were highly effective against bollworms **Earias vittella** F., **Heliothis armigera** Hub. and **Pectinophora gossypiella** S. on cotton. Thangaraju et.al. (1988) reported that synthetic pyrethroid fenvalerate 0.075 kg a.i/ha gave the lowest incidence of bollworms on green bolls and loculi of MCU 9 upland cotton.

MATERIALS AND METHODS

With a view to evaluate the efficacy of newer synthetic pyrethroids viz. cyhalothrin and fluvalinate, two field experiments were conducted at Cotton breeding station, Coimbatore. The experiments were conducted in a randomized block design with three replications. Seeds of MCU 9 were sown with a spacing of 75 x 30 cm in a plot of 20 m^2. The treatments consisted of synthetic pyrethroids and conventional insecticides with an untreated control (Table 1 and 2). The incidence of bollworms was monitored by assessing the damage on ten plants per plot selected at random at weekly intervals. The insecticides were sprayed when the bollworm infestation crossed the economic threshold level of 10% damage to fruiting parts. In addition, two alternate sprayings of fenvalerate alternated with endosulfan and endosulfan alternated with fenvalarate were included. The observations were recorded on the green bolls and on loculi and the percentage of infestation calculated. The data were analysed statistically. The data on yield of seed cotton at different pickings were pooled and analysed statistically.

RESULTS AND DISCUSSION

During first year, the damage to green bolls ranged from 7.32% to 24.67%, while damage to the loculi varied 3.4%

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Table 1. Bioefficiency of insecticides against bollworms

(First Year)

Treatments	Dose (Kg a.i./ha)	Damage (%)		Bad kapas content (%)	Yield of seed cotton (kg/ha)
		Bolls	Locull		
Cyhalothrin 5 EC	0.025	8.98 (17.30)	3.92 (11.32)	14.20 (22.06)	1533
Fluvalinate 25 EC	0.075	7.57 (15.89)	3.42 (10.01)	15.30 (23.04)	1475
Cypermethrin 10 EC	0.060	7.32 (15.68)	4.61 (12.39)	15.80 (23.42)	1753
Flucythrinate 10 EC	0.050	8.13 (16.57)	3.52 (10.73)	11.83 (19.79)	2033
Amitraz 20 EC	0.750	7.86 (16.22)	3.31 (10.29)	25.73 (30.43)	1211
Monocrotophos 36 WSC	0.500	14.55 (22.34)	7.08 (15.41)	34.40 (35.87)	1646
Endosulfan 35 EC	0.700	8.75 (16.94)	3.26 (10.23)	15.53 (23.18)	1450
Fenvalerate 20 EC	0.075	8.78 (17.17)	3.04 (9.95)	11.20 (19.52)	1578
Endosulfan alternated with fenvalerate	0.700 0.075	9.30 (17.75)	4.47 (12.11)	14.66 (22.36)	1670
Fenvalerate alternated with endosulfan	0.075 0.700	11.72 (19.96)	4.11 (11.68)	12.10 (20.04)	1600
Check		24.67 (29.74)	10.27 (18.59)	42.30 (40.58)	978
CD (P = 0.05)		4.55	3.44	5.10	NS

N.S. Not significant

to 10.27% (Table-1). Synthetic pyrethroids cyhalothrin and fluvalinate and conventional insecticides viz. endosulfan 35 EC were on par with each other showing their effectiveness on the control of bollworms. Monocrotophos, though superior to control was less effective as compared to the rest of the insecticides. The yield of seed cotton was not significant and there was not

Table 2. Bioefficacy of insecticides against bollworms

(Second Year)

Treatments	Dose (Kg a.i./ha)	Damage (%)		Bad kapas content (%)	Yield of seed cotton (kg/ha)
		Bolls	Locull		
Cyhalothrin 5 EC	0.025	5.68 (13.65)	2.76 (9.52)	10.23 (17.84)	1100
Fluvalinate 25 EC	0.075	3.24 (9.82)	1.97 (7.90)	7.59 (15.55)	1390
Cypermethrin 10 EC	0.060	4.83 (12.60)	3.02 (9.96)	6.94 (14.94)	1580
Flucythrinate 10 EC	0.050	3.06 (9.72)	2.41 (8.84)	5.99 (13.05)	1550
Amitraz 20 EC	0.750	6.77 (14.21)	3.82 (11.18)	14.12 (21.96)	1550
Monocrotophos 36 WSC	0.500	8.17 (16.48)	5.40 (13.22)	17.75 (23.95)	1130
Endosulfan 35 EC	0.700	6.05 (14.17)	3.31 (10.50)	8.49 (16.82)	1380
Fenvalerate 20 EC	0.075	3.12 (9.44)	2.60 (8.99)	7.46 (15.27)	1780
Endosulfan alternated with fenvalerate	0.700 0.075	5.19 (12.37)	3.62 (10.78)	7.47 (15.70)	1430
Fenvalerate alternated with endosulfan	0.075 0.700	6.95 (15.15)	3.79 (11.19)	6.91 (14.76)	1400
Check		18.52 (25.16)	11.08 (19.27)	16.99 (24.26)	1200
CD (P = 0.05)		5.90	3.57	NS	NS

NS - Not significant

much difference among treatments. However, flucythrinate recorded a maximum of 2033 kg/ha, while it was 978 kg/ha only in the untreated check. With regard to the bad kapas content, fenvalerate recorded 11.20% whereas it was 42.30% in untreated check (Table-1). During second year, bollworm damage ranged from 3.66% to 18.52% (Table-2). Fluvalinate recorded a damage of 1.97%

on loculi basis followed by 2.41% and 2.60% in flucythrinate and fenvalerate respectively. The maximum yield of 1780 kg/ha was recorded in fenvalerate as against 1200 kg/ha in the control.

Agarwal **et.al.** (1983) Sellammal Murugesan **et.al.** (1979) also reported that fenvalerate was highly effective in reducing the damage caused by bollworms. Flucythrinate at 0.50 kg a.i./ha was reported to be effective by Duhoon and Banerjee (1986) and the present results are in agreement with earlier reports. Cyhalothrin, a new insecticide was effective against boll weevil and whitefly (Norton **et.al.**, 1986). In the present study, cyhalothrin was found to be effective against bollworms.

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