https://doi.org/10.29321/MAJ.10.A02466

Madras agric J. 71 (4) 242—245 April 1984.

CONTROL OF REDGRAM POD BORERS WITH NEWER INSECTICIDES

P. C. SUNDARA BABU[1] S. KUPPUSWAMY[2] and P. V. SUBBA RAO[3]

Two field trials were conducted separately to assess the efficacy of certain sprays and dusts against pod borers and podfly on redgram. Two rounds of treatments were given, the first at 50 per cent flowering and the second 15 days after the first round. Among the sprays, deltamethrin 0.002% was the most effective in reducing the infestation of pod borers and podfly and recording the highest yield. The next in the order was endosulfon 0.07%. Among the dusts, endosulfan 4% was superior in reducing the infestation of pod borers and podfly and recorded maximum yield followed by Phoxim 1.5% dust.

Redgram, an important pulse crop in Tamil Nadu is infested by a variety of insect pests; of which the pod borer complex comprising of seven insect species plays a vital role in deciding the grain yield. Hanifa *et al.* (1978) reported the efficacy of dust, spray and granular formulation of insecticides in controlling the pod borer of redgram. Chaudhary *et al.* (1980) screened seven dust formulations and nine formulations spray for the control of pod borer on redgram. With a view to assess the efficacy of new spray and dust formulations including that of synthetic pyrethroids, field experiments were conducted in kharif, 1981 and the results are presented in this paper.

MATERIALS AND METHODS

Two field trials were conducted to evaluate the efficacy of seven spray formulations and seven dust formulations separately with CO3 redgram in plots of 4.8 x 3 m with a spacing of 50 x 30 cm in randomised block design with 3 replications. A quantity of 500 litres of spray fluid was used to cover an hectare and dusts were applied at 25 kg/ha. Two rounds of treatments were given, the first at 50 per cent flowering and the second 15 days after the first round. In both the trials, four species of pod borers viz., *Heliothis* armigera Hb., Melanagromyza obtusa M., Maruca testulalis G. and Exelastes atomosa W. were observed to damage the pods. The pod borer damage was assessed both on pod basis (total number of of pods and damaged pods in five plants per replication) and grain basis (25 pods per plant and 5 plants per replication). Pod fly damage was assessed on pod basis. The yield data were gathered for the entire plot. The data were analysed statistically and the details are furnished in Tables 1 and 2.

1, 2 and 3 Associate Professors in Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore-641 003.

RESULTS AND DISCUSSION

Spray formulations

Pod borer damage on pod basis

All the insecticides were superior to control in recording lower damage. Among the insecticides, deltamethrin recorded the lowest pod borer damage (25.9%) and was significantly superior to other treatments. The next in order were cypermethrin (31.4%) and endosulfan 0.07% (31.6%) and these two were on a par. The control plots recorded the maximum damage of 63.4 per cent.

Pod borer damage on grain basis

Deltamethrin recorded the lowest damage of 17.6 per cent and was significantly superior to other treatments. The next in order were endosulfan (19.5%), cypermethrin (20.1%), and monocrotophos (23.9%).

Podfly damage

The podfly damage ranged from 19.6% in deltamethrin to 42.1% in control. The treatments endosulfan (21.8%), cypermethrin (24.6%) and triazoohos (29.0%) were next to deltamethrin in the order of efficacy.

Yield:

All the insecticides recorded higher yields compared to that of untreated check. Among them, deltamethrin recorded the highest yield of 1285 kg/ha and was followed by cypermethrin (1222 kg/ha) and endosulfan (1180 kg/ha) and these three were on a par. The control plot recorded the minimum yield of 340 kg/ha.

Dust formulations

Pod borer damage on pod basis

All the insecticides were independently superior to control. Among them, endosulfan recorded the lowest damage (23.8 %) and was followed by phoxim (27.1%), HCH (34.4%), phosalone 4% (41.3%) and phosalone 2% (43.7%). The highest damage was noticed in control (69.8%).

Pod borer damage on grain basis

Endosulfan redorded the least damageof 16.9%. The next in order were phoxim (21.5%), quinalphos (24.1%) and phosalone 4% (25.7%). Control plots recorded the highest damage of

Podfly damage

Endosulfan recorded the lowest podfly damage of 12.9%. The next in order were phoxim (16.4%), HCH (23.9%), phosalone 2% (27.7%). and quinalphos (28.86%). Control plots recorded the highest damage of 50.9%. 55.1%.

Yield

Endosulfan dust recorded the highest yield of 1042 kg/ha and was significantly superior to other treatments. The next in order were phoxim (810 kg/ha) and quinalphos (713 kg/ha) and were on a par. Control plots recorded the lowest of 269 kg/ha.

From the data, it can be seen that deltamethrin 0.002% was effective in reducing the infestation of pod borers (pod basis or grain basis) and pod fly followod by endosulfan 00.7%. Deltamethrin recorded the highest yield followed by endosulfan. The efficacy of endosulfan has already been

reported by Saharia and Dutta (1975), Balasubramanian *et al.* (1977) Surulivelu *et al.* (1977), Chelliah *et al.* (1978) and Chaudhary *et al.* (1980b).

Among the dusts, application of endosulfan 4% was superior in reducing the infestation of pod borers (pod basis and grain basis) and pod fly followed by phoxim 1.5%. Endosulfan also recorded the highest yield followed by phoxim 1.5%. This is in conformity with the findings of Chelliah *et al.* (1978) and Chaudhary *et al.* (1980b) who have established the superior efficacy of endosulfan 4% dust in the control of redgram pod borers.

When data of both the trials are perused it is evident that in general, plots trated with spray formulations recorded higher yields than dusted plots. Moreover, for the same insecticides viz., endosulfan and quinalphos which were tested both as dust and spray, sprays resulted in more yield than dusts.

The work was carried out under the All India Co-ordinated Pulse Improvement Project (ICAR) and the authors are thankful to the ICAR for the financial support and to Director, School of Genetics for the facilities provided for the studies.

REFERENCES

BALASUBRAMANIAN, G., R. J RABINDRA, P. P. VASUDEVA MENON and T. R. SUBRAMANIAM 1976. Control of redgram pod borers with spray formulations. *Madras agric. J 63*: 251-252.

CHAUDHARY, J. P., L. S. YADAV and K. B. RUSTAGI 1980a. Studies on the chemical control of *Heliothis armigera* (Noctuidae Lepidoptera) on pigeonpea *Cajanus cajan H. A. U. J. Res.* 10 . 472-475.

CHAUDHARY, J. P., L. S. YADAV and F. S. POONIA 1980b. An integrated approach for the control of pod borer, *Heliothis armigera* on pigeonpea (*Cajanus cajan*) *Legume research 3*: 59-65.

CHELLIAH, S. T. SURULIVELU, G. BALASUBRAMANIAN and P. P. VASUDEVA MENON 1978. Studies on the control of redgram (*Cajanus calan*) pod borers *Madras agric. J. 65*: 183-187.

HANIFA, A. M., G. BALASUBRAMANIAN, R. J. RABINDRA, T. SURULIVELU and P. P. VASUDEVA MENON 1978 Comparative efficacy of dust, spray and granular formulations of insecticides in controlling the pod borers of redgram *Indian J. Plant Prot.* 5: 83.

SAHARIA, D. and B. DUTTA 1975. Control of *Helicoverp armigera* a serious pest of arhar (*Cajanus cajan*) in Assam. *Pesticides* . 9: (8): 34-35.

SURULIVELU, T., G. BALASUBRAMANIAN, P. P. VASUDEVA MENON and R. J. RABINDRA 1977. Efficacy of certain insecticide in the control of redgram pod borers. *Madras agric. J. 64* :54-56.

Table 1 Efficacy of spray formulations in the control of pod borers and podfly and yield of redgram

Treatment	g ai/ha	Pod borer damage%		Podfly damage %	Yield in kg	
		Pod basis	Grain basis		per plot	per ha
Fenvalerate 0.004%	20	41.80 (40.25)	26.50 (30.33)	29.80 (33.09)	1.62	1124
Deltamethrin 0.002%	10	25.90 (30.53)	17.60 (24.82)	19.60 (26.30)	1.85	1285
Cypermetherin 0.004%	20	31.40 (34.05)	20.10 (26.59)	24.60 (29.73)	1.76	1222
Endosulfan 0.07%	350	31.60 (34.17)	19.50 (26.15)	21.80 (27.81)	1.70	1180
Quinalphos 0.05%	250	46.80 (43.12)	37.50 (37.70)	37.30 (37.46)	1.35	937
Triazophos 0.07%	350	40.90 (39.75)	25.10 (30.04)	29.00 (32.58)	1.49	1035
Monocrotophos 0.04%	200	41.50 (40.10)	23.90 (29.26)	30.70 (33.62)	1.33	924
Control		63.40 (52.78)	52.00 (46.15)	42.10 (41.03)	0.49	340
CD (P = 0.01)		0.737	0.417	0.366	0.159	

(Figures in parentheses are arcsin $\sqrt{\text{percentage}}$ transformed values.

Table 2 - Efficacy of dust formulations in the control of pod borers and podfly and yield of redgram

Treatment	g ai/ha	Pod borer damage%		Podfly	Yield in kg	
		Pod basis	Grain basis	damage%	per plot	per ha
HCH 10%	2.5	34.30 (35.91)	27.20 (31.45)	23.90 (29.30)	0.767	533
Phosalone 2%	0.5	43.70 (41.38)	28.30 (32.16)	27.70 (31.75)	0.600	417
Phosalone 3%	1.0	41.30 (39.96)	25.70 (30.45)	33.50 (30.34)	0.927	644
Endosulfan 4%	1.0	23.80 (29.16)	16.90 (24.29)	12.90 (21.03)	1.500	1042
Quinalphos 1.5%	0.375	45.35 (42.31)	24.10 (29.39)	28.80 (34.52)	1.027	713
Phoxim 1.5%	0.375	27.10 (31.40)	21.50 (27.60)	16.40 (23.90)	1.167	810
BPMC 2%	0.5	45.80 (42.60)	30.70 (33.66)	33.60 (35.42)	0.580	403
Control		69.80 (56.70)	56.10 (44.71)	50.90 (45.75)	0.387	269
CD (P=0.01)		0.595	0.583	0.703	0.194	

(Figures in parentheses are arcsin/$\sqrt{\text{percentage}}$ transformed values.