

## Control of Bengalgram Pod Borer, *Heliothis armigera* Hubner

BY

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### ABSTRACT

Three field experiments with dusts, three with spray formulations and two demonstration trials were conducted during 1971-74 for the control of the bengalgram pod borer. Dust formulations were superior to the sprays in reducing the pod borer damage and increasing the yield. Among the dusts, endosulfan 4 per cent was superior followed by carbaryl 10 per cent, methyl parathion + DDT 10 per cent, lindane 0.65 per cent and malathion 4 per cent in efficacy. Endosulfan 4 per cent dust consistently recorded higher yields and lower pod borer damage.

### INTRODUCTION

Bengalgram (*Cicer arietinum* Linn.) is subjected to the attack by *Agrotis* spp., *Heliothis armigera* Hubner and *Tanymecus indicus* F. (Srivastava, 1964). Of these, *Heliothis armigera*, a polyphagous pest, feeds on the flower buds, flowers and pods by boring into them resulting considerable reduction in yield. Studies were made to evolve an effective control for this pest and to maximise the yield, and the results of the experiments are now presented.

### MATERIALS AND METHODS

Three field experiments with dust formulations (Table I) and three field experiments with spray formulations (Table II) were laid out in 1971-74 in randomised block designs, replicated

four times with Bengalgram variety N. 59. Dusts were applied at 1 kg a.i./ha and sprays at 600 lit. of spray fluid/ha at the pod formation stage. The incidence of pod borer was assessed by recording the total number of pods and affected pods from five plants, 3 and 7 days after treatment. The yield data were also gathered.

### RESULTS AND DISCUSSION

Dusts of endosulfan 4 per cent (25 kg/ha), carbaryl 10 per cent (10 kg/ha) and methyl parathion + DDT 10 per cent (10 kg/ha) were highly superior in recording the minimum damage of pod borer and increased yield in the first two experiments which is in conformity with the findings of Subba Rao *et al.* (1972). In the third trial, the yield was found

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TABLE I. Effect of certain insecticidal dust formulations on the infestation by *H. armigera* and yield in bengalgram

Treatment	Mean % of pod borer			Mean yield in g/plot			Yield in kg/ha		
	Experiment			Experiment			Experiment		
	I	II	III	I 20 m <sup>2</sup>	II 10 m <sup>2</sup>	III 20 m <sup>2</sup> (in kg)	I	II	III
Endosulfan 4%	8.2 (16.64)	3.4 (10.63)	7.5 (15.89)	785	531	2.93	393	531	1465
Carbaryl 10%	8.4 (16.85)	5.0 (12.92)	5.8 (13.94)	695	463	2.72	343	463	1360
Methyl parathion + DDT 10%	8.5 (16.95)	4.7 (12.52)	N.T.	680	450	N.T.	340	450	N.T.
Leptophos 3%	9.7 (18.15)	5.3 (13.31)	N.T.	583	455	N.T.	291	455	N.T.
Tetrachlorvinphos 5%	10.2 (18.63)	5.9 (14.06)	5.8 (13.94)	600	441	2.54	300	441	1270
Lindane 0.65%	N.T.	N.T.	6.9 (15.23)	N.T.	N.T.	2.99	N.T.	N.T.	1495
Malathion 4%	N.T.	N.T.	6.9 (15.23)	N.T.	N.T.	2.74	N.T.	N.T.	1370
Control	13.4 (21.47)	9.2 (17.76)	11.6 (19.91)	513	351	2.25	257	351	1125
C. D. (P = 0.05)	0.85	1.003	2.06	118.00	49.78	0.36			

N.T. = Not tried.

Figures in parentheses are transformed values.

to be higher under lindane 0.65 per cent dust followed by endosulfan 4 per cent, malathion 4 per cent and carbaryl 10 per cent dusts in the order of their efficacy which were also on par with each other in recording the less mean pod borer damage.

Among sprays, carbophenothion 0.04 per cent, tetrachlorvinphos 0.05 per cent, trichlorphon 0.05 per cent and dichrotophos 0.05 per cent were quite effective in increasing the yield and recording less pod borer damage in the first two experiments in the order of their efficacy. In the third experiment all the treatments were on par with each other in controlling the

pod borer and giving higher yields than control. However, endosulfan 0.07 per cent recorded the maximum yield followed by carbophenothion 0.04 per cent.

Earlier studies have revealed that dusting of DDT 5 per cent (Nagarajan, 1961) or BHC 10 per cent or trichlorphon spray (Rangarajan, 1970) was effective in controlling this pod borer. Subba Rao *et al.* (1972) found that one round of application of dusts of either BHC 10 per cent or carbaryl 10 per cent, or trichlorphon 5 per cent, or carbophenothion 2 per cent or imidon 2 per cent, at the pod

TABLE II: Effect of certain insecticidal spray formulations on the infestation by *H. armigera* and yield on bengalgram

Treatment	Mean % of pod borer Experiment			Mean yield in kg/ plot Experiment			Yield in kg/ha Experiment		
	I	II	III	20m <sup>2</sup>	10m <sup>2</sup>	20m <sup>2</sup>	I	II	III
Carbophenothion 0.04%	20.3 (26.78)	3.7 (11.09)	10.4 (18.8)	0.640	0.455	2.81	320	455	1405
Tetrachlorvinphos 0.05%	21.9 (27.90)	4.4 (12.03)	8.4 (16.8)	0.596	0.438	2.49	298	438	1245
Trichlorphon 0.05%	22.1 (28.04)	3.0 (9.98)	8.0 (16.4)	0.572	0.403	2.70	286	403	1350
Dichrotophos 0.05%	20.2 (26.71)	3.2 (10.31)	8.0 (16.4)	0.570	0.402	2.18	285	402	1090
Endosulfan 0.07%	23.4 (28.93)	3.6 (10.94)	7.5 (15.9)	0.506	0.375	3.45	253	375	1725
Monocrotophos 0.04%	N.T.	N.T.	8.2 (16.6)	N.T.	N.T.	2.65	N.T.	N.T.	1325
Control	32.6 (34.82)	5.8 (13.94)	13.5 (21.6)	0.434	0.336	2.30	217	336	1150
C. D. (P = 0.05)	1.810	2.50	2.58	0.106	0.054	0.66			

N.T. = Not tried

Figures in parentheses are transformed values

formation stage at 25 kg/ha would minimise the pod borer infestation.

Dusts were superior to sprays in recording less pod borer damage and higher yields. Among the dust formulations, endosulfan 4 per cent dust was superior followed by carbaryl 10 per cent dust, methyl parathion+DDT 10 per cent, lindane 0.65 per cent dust and malathion 4 per cent dust in the order of their efficacy. Application of endosulfan 4 per cent dust has consistently recorded higher yields and less pod borer damage.

## REFERENCES

- NAGARAJAN, K. R. 1961. A guide to the control of crop pests. (*Agricultural Information Service Unit, Madras*) p. 52-61.
- RANGARAJAN, A. V., S. KANAGARAJ DAVID, P. V. SUBBA RAO and A. AZEEZ BASHA. 1970. Field tests of chemicals for control of the Bengalgram (Chick pea) pod borer. *Madras agric. J.* 57: 26.
- SRIVASTAVA, B. K. 1964. Entomology in India. *Entomological Society of India, New Delhi-12.* p. 83-91.
- SUBBA RAO, P. V., A. V. RANGARAJAN and A. AZEEZ BASHA. 1972. A note on the control of *Heliothis armigera* H. on Bengalgram.—*Sci. & Cult.* 38: 202-03.