

INSECTICIDAL CONTROL OF CASTOR SEMILOOPER AND CAPSULE BOREF

B. SENAPATI and A.N. DASH

Field evaluation of 12 insecticides against the semilooper, *Achaea janata* L. and the capsule borer, *Conogethes (Dichocrocis) punctiferalis* Guen. of castor indicated that the best control of the semilooper and higher seed yield were obtained with endosulfan 0.5 Kg a.i./ha when sprayed thrice at 21 days interval from 48 days after sowing castor.

The semilooper, *Achaea janata* L. and the capsule borer, *Conogethes (= Dichocrocis) punctiferalis* Guen. are the serious pests of castor in Orissa. Excessive foliage damage by the former, inflorescence and capsule by the latter pest results in considerable yield loss to the crop. For devising effective control schedules against these two pests, twelve insecticides were evaluated in the field on the variety 'Aruna' and the results are reported in this paper.

MATERIALS AND METHODS

Two trials were conducted during Kharif 1981 and 1982 at the Regional Research Station, Keonjhar, Orissa in a RB design with four replications in a plot size of 30m². Spacings of 60 and 45 cm between rows and plants respectively were maintained. The treatments consisted of carbaryl @ 1.0, cypermethrin, fenvalerate and permethrin @ 0.1, chlorpyrifos, endosulfan, fenitrothion, fenthion, methamidophos, monocrotophos, phenthoate and quinalphos @ 0.5Kg a.i./ha were sprayed

thrice at 21 days interval, commencing at 48 days after sowing. The larval population of the semilooper was recorded at 1 day before and 3, 7 and 20 days after each spraying. Seed yield obtained from each treatment was recorded. The data on percentage of leaf and inflorescence infestation and capsule infestation as well as larval population and reduction recorded for the three sprayings were pooled and subjected to statistical analysis as recommended by Snedecor and Cochran (1959) after appropriate transformation.

RESULTS AND DISCUSSION

The results indicated that all the insecticides except fenthion and phenthoate demonstrated high initial toxicity to the semilooper. The higher residual toxicity of methamidophos, endosulfan, carbaryl, permethrin, monocrotophos and fenvalerate upto 14 days after application was evident from the significantly low larval population in these treatments (Table 1).

Table 1. Effect of insecticides on the incidence of *Achaea janata* on castor and seed yield (Mean of 4 observations)

Insecticide	Dose (Kg a. i. / ha)	Mean larval population / plant (1981)				Seed yield pe 30 m ²
		(Days after application)				
		3	7	14	20	
Carbaryl	1.0	0.05 (0.74)	0.97 (1.21)	1.47 (1.39)	1.37 (1.36)	14.9
Chlorpyrifos	0.5	0.05 (0.74)	1.27 (1.31)	1.77 (1.50)	1.57 (1.43)	16.7
Cypermethrin	0.1	NI	NI	NI	NI	NI
Endosulfan	0.5	0.05 (0.74)	0.97 (1.20)	1.40 (1.37)	1.17 (1.28)	17.0
Fenitrothion	0.5	0.15 (0.80)	1.23 (1.31)	2.30 (1.64)	1.43 (1.38)	15.4
Fonthon	0.5	0.12 (0.78)	1.87 (1.51)	2.40 (1.68)	1.70 (1.48)	13.2
Fenvalerate	0.1	0.02 (0.72)	1.10 (1.26)	1.30 (1.33)	1.17 (1.28)	12.5
Methamidophos	0.5	0.06 (0.74)	0.33 (1.06)	1.67 (1.47)	1.53 (1.42)	14.2
Monocrotophos	0.5	0.03 (0.73)	1.10 (1.25)	2.00 (1.56)	2.20 (1.63)	16.0
Permethrin	0.1	0.07 (0.75)	0.97 (1.20)	1.43 (1.39)	1.53 (1.42)	16.8
Phenthoate	0.5	0.05 (0.74)	1.77 (1.50)	3.03 (1.86)	1.97 (1.56)	13.4
Quinalphos	0.5	0.07 (0.75)	2.00 (1.57)	1.60 (1.44)	1.40 (1.37)	16.4
Control	-	1.08 (1.25)	2.50 (1.72)	3.03 (1.86)	1.77 (1.50)	13.4
C.D (P=0.05)		0.05	0.37	0.33	N.S.	N.S.

N.S. = Not Significant;

N. I. = Not Included;

Figures in parentheses are $\sqrt{\text{actual population} + 0.5}$

Beyond 14 days, the residual effectiveness of the insecticides was not satisfactory. The extent of leaf infestation was significantly less in endosulfan, permethrin, and carbaryl treated plots. Fenvalerate, quinalphos and monocrotophos were the next effective treatments in reducing the leaf infestation. Kushwaha and Pal (1977) and Pal (1977) reported the effectiveness of carbaryl against *A. janata*. Permethrin and monocrotophos were also reported to give quick knock down of the semilooper (Ismail and Salim, 1982).

The extent of infestation of inflorescence and capsule by the capsule borer ranged from 22.8 to 34.8 and 7.1 to 9.4 per cent in 1981 and 22.9 to 41.1 and 8.4 to 17.2 per cent in 1982 in different treatments respectively and the differences between treatments were not significant. However, low infestation of inflorescence by methamidophos, monocrotophos and endosulfan and that of capsules by quinalphos, methamidophos, carbaryl and endosulfan were effected for two years. Effective control of *D. punctiferalis* by carbaryl was reported Mandal *et al.* (1978). Naganathan *et al.* (1983) observed that none of the chemicals could afford protection to cardamom from rhizome borer damage which is in agreement with the present results.

The highest seed yields of 17.0 and 10.7 Q/ha were obtained from endosulfan treatment during 1981 and 1982 as against 13.4 and 7.8 Q/ha in untreated check respectively.

REFERENCES

- ISMAIL, A. and J. SALIM. 1982. An outbreak and some notes of the noctuid, *Achaea janata*, L., on *Excoecaria agallocha*, L.; in Hutan Melintang Perak. *MAPPs Newsl.* 6 (2) : 2-3.
- KUSHWAHA, K. S. and S. K. PAL: 1977. Effectiveness of some insecticides against castor semilooper, *Achaea janata* Linn. *Indian J. Ent.* 39(2) : 193-196.
- MANDAL, S. C., S. N. GHOSH and R.P. SINHA. 1978. Chemical control of castor capsule borer, *Dichocrocis punctiferalis* Guen. *Indian J. Ent.* 40(4) : 460-462.
- NAGANATHAN, T. G., A. REGUPATHY and D. KUMARESAN. 1983. Efficacy of certain insecticides, in controlling the cardamom stem borer *Dichocrocis punctiferalis* Guen. *Pesticides* 17(6) : 22-23.
- PAL, S.K. 1977. Relative effectiveness of some insecticides and bacterial insecticides against castor semilooper (*Achaea janata* L.) *Indian J. Pl. Prot.* 5 (2) : 195-198.
- SNEDECOR, G.W. and W.G. COCHRAN: 1959. *Statistical Methods*, Iowa State College press, Iowa pp. 163-169.