

PHYTOTONIC EFFECTS OF INSECTICIDES IN PIGEON PEA *Cajanus cajan* (L.) Millsp.

P. N. MISHRA¹ and H. P. SAXENA²

Three rounds of foliar sprays with monocrotophos 0.04%, dimethoate 0.03% and quinalphos 0.05% commencing the first round 15 days after sowing and the second and third rounds at ten days interval coinciding with the heading stage significantly increased the plant height, leaf surface area, pod length, petiole length and pod numbers in pigeon pea crop, controlled leaf hopper, *Empoasca kerri* Pruthi and galerucid beetle, *Madurasia obscurella* Jacoby and gave increased grain yield.

The phytotonic effects of various insecticides was earlier reported by Gupta and Saxena (1971) and Verma & Rattan Lal (1978) on green gram and cow pea, respectively, in addition to controlling the target insects. In the present communication the phytotonic effects of monocrotophos, dimethoate and quinalphos are reported.

MATERIAL AND METHODS

A field trial was laid out in randomised block design replicated four times with a net plot size of 22.5 sq mt. at IARI, New Delhi during 'kharif, 1980. The variety 'Prabhat' was sown with a spacing of 60 x 22 cm. The treatments consisted of monocrotophos (Nuvacron 40EC) 0.04, dimethoate (Roggor 30 EC) 0.03 and quinalphos (Ekalux 25 EC) 0.05%. The first spray was given when the crop was six weeks old, second and third sprays were applied at the heading stage at an interval of

10 days. Pest populations and plant characters were recorded on 5 randomly selected and tagged plants per plot. The leaf hopper *Empoasca kerri* Pruthi and galerucid beetle *Madurasia obscurella* Jacoby damage was assessed seven days after the first round. The damage by galerucid beetle was recorded on 15 lower leaves. Total no. of pods and no. pods of attacked by *Melanagromyza* sp. and *Heliothis* sp. were recorded on 5 plants. The plant height was recorded before spraying and at the time of maturity. The leaf surface area and petiole length were measured from the top leaf (trifoliolate) of 3rd apical branch, 60 days after the first spray when vegetative growth of the plant ceased, using graph paper technique. The total number of branches were counted a day before harvest. The length of the pod was measured @ ten pods per plant. The grain yield was recorded in each plot leaving the border rows.

1. Assistant Professor (Entomology), Department of Entomology, G. B. Pant University of Agriculture & Technology, Pantnagar District Nainital, U. P.

2. Emeritus Scientist, Division of Entomology, Indian Agricultural Research Institute, New Delhi.

RESULTS AND DISCUSSION

All the insecticidal treatments, significantly reduced the populations of leaf hopper and galerucid beetle. Among them monocrotophos and dimethoate sprays both at 2 & 3 rounds were superior than quinalphos. The superior efficacy of monocrotophos against the jassid, *Empoasca kerri* Pruthi in green gram was also earlier reported by Gupta (1970), Sidhu and Sandhu (1971) and against *Madurasia* sp. in green gram by Gupta (1970) as well as the effect of monocrotophos and dimethoate against the galerucid beetle in black gram, *Vigna mungo* (L.) Hepper by Naresh (1971).

Monocrotophos and dimethoate significantly increased the leaf surface area and length of the petiole compared to quinalphos. The increase in plant vigour as a result of spraying with monocrotophos in green gram, *Vigna radiata* (L.) Wilczek was earlier reported by Gupta and Saxena (1971).

Similar effects of monocrotophos & dimethoate were observed to increase the number of branches, pod length, number of pods per plant, height of the plants and grain yield. Spraying with monocrotophos 0.05 per cent in cow pea, *Vigna sinensis* Savi increased the number of pods by killing the nymphs and adults of leaf hopper, *Empo-*

asca kerri Pruthi (Verma and Rattan Lal, 1968). Monocrotophos 0.04 per cent sprayed thrice gave the highest per hectare yield, which is in conformity with the findings of Gupta and Saxena (1971) in green gram and of Thobbi and Singh (1978) in pigeon pea.

REFERENCES

- GUPTA, B. N. 1970. Studies on chemical control of galerucid beetle, *Madurasia obscurella* Jacoby and jassid, *Empoasca Kerri* Pruthi on green gram (*Phaseolus aureus*) Roxb unpubl M. Sc. Thesis, IARI, New Delhi.
- GUPTA, B.N and H.P. SAXENA. 1971. Chemical control of 'moong' (*Phaseolus aureus* Roxb.) pests lead to spectacular rich plant growth and yield. *Proc. 5th Workshop on Pulse Crops* ('Kharif' Pulses) Hissar, India 118-9.
- NARESH, J. N. 1971. Insecticidal trial for the control of insect pests of cowpea, *Proc. 5th Workshop on Pulse Crops* ('Kharif' Pulses) Hissar, India 130-31.
- SIDHU, A. S. and A. S. SANDHU, 1971. Studies on the control of 'Moong' jassid through the use of soil systemic insecticides. *Proc. 5th Workshop on Pulse Crops* ('Kharif' Pulses) Hissar, India 123-5.
- THOBBI, V. V. and B. U. SINGH, 1978. Control of pod fly (*Melanogromyza obtusa* Malloch) on pigeon pea (*Cajanus cajan* (L.) Millsp. *Pesticides* 12 : 23-4.
- VERMA, S. and R. LAL, 1978. Evaluation of pesticides against the pests of cowpea crop (*Vigna sinensis* Savi.). *Indian J. Entomol.* 40 : 54-8.

Table 1 Effect of foliar application of insecticides on populations of jassid and galerucid beetle

Treatments	No. of rounds	Mean of 4 replications			
		Population of jassids 7 days after treatment	% leaves damaged by galerucid beetle 15 days after treatment	<i>Melanagro-myza</i> sp.	Damaged pods (%) <i>Heliothis</i> sp.
Monocrotophos	2	0.11	1.7 (7.49)	5.5 (13.56)	2.8 (9.63)
Dimethoate	2	0.18	1.7 (7.49)	5.8 (13.94)	5.2 (13.18)
Monocrotophos	3	0.12	1.3 (6.55)	1.2 (6.29)	1.4 (6.80)
Dimethoate	3	0.17	1.7 (7.49)	1.8 (7.71)	3.1 (10.14)
Quinalphos	2	2.69	51.1 (45.63)	14.0 (21.97)	5.9 (14.06)
Quinalphos	3	2.71	51.7 (45.97)	13.0 (21.13)	3.5 (10.78)
Control (Untreated)		3.12	82.3 (65.12)	24.6 (29.73)	15.8 (23.42)
CD (P=0.05)		0.09	(1.92)	(0.89)	(0.36)

(Figures in parentheses are the transformed values)

Table 2 Effect of foliar application of insecticides on pigeon pea plant.

Treatment	No. of rounds	Plant height in (cm)	Leaf area in (sq. cm)	Length of petiole in (cm)	No. of branches per plant	Length of pod in (cm)	No. of pods per plant	Yield Kg/ha
Monocrotophos	2	147.3	20.9	3.4	23.0	6.7	255.0	1373
Dimethoate	2	147.1	20.5	3.4	22.2	6.6	254.0	1266
Monocrotophos	3	148.6	21.1	3.4	23.0	6.7	257.3	1877
Dimethoate	3	148.2	20.7	3.4	22.3	6.6	254.3	1499
Quinalphos	2	134.8	15.9	2.9	17.0	4.4	188.8	713
Quinalphos	3	135.1	16.1	2.9	17.5	4.5	189.8	1146
Control (Untreated)		122.9	15.0	2.3	13.5	3.5	105.3	539
C.D. (P=0.05)		2.2	0.65	0.09	1.02	0.33	4.3	49