Entomon, 1976, *Vol.* 1, *No.* 2, *pp.* 147 *to* 149.

RESIDUAL TOXICITY OF DEPOSITS OF SOME MODERN INSECTICIDES TO APTEROUS ADULTS OF *MYZUS PERSICAE* SULZER ON POTATO PLANTS

S. S. MISRA, V. K. CHANDLA & D. K. NAGIA
Division of Entomology, Central Potato Research Institute,
Simla (H. P.), India 171001

(Received 21 June 1976)

The residual toxicity of deposits of some systemic and contact insecticides to apterous adults of *Myzus persicae* on potato plants is discussed.

INTRODUCTION

Myzus persicae SULZER, popularly known as green peach aphid is an important vector of potato viruses and is prevalent both in hilly regions and plains of India. Existing literature on insecticidal control of aphid vectors of potato virus diseases reveals phorate (granules), oxydemeton – methyl (E.C.), disulfoton (granules) and dimethoate (E. C.) to be effective (NIRULA, 1962; NIRULA & KUMAR, 1969; ANONYMOUS, 1971; MISRA & VERMA, 1974). The present studies under field-cum–laboratory conditions were carried out to evaluate the residual toxicity of the deposits of some modern (systemic and contact) insecticides on potato plants against apterous adults of aphid, *M. persicae*. The purpose of including the contact insecticides in this trial was to select some residually effective contact insecticides which may be used as a substitute of oxydemeton-methyl (most popular foliar systemic insecticide) and other foliar systemic insecticides under certain situations, especially when the spray treatment is desired to potato crops which are near the harvest.

MATERIAL AND METHODS

Potato variety "*Kufri chandramukhi*" was grown during autumn, 1975 in 3.0 x 2.5 m plots at Simla. Each plot contained 6 rows of 12 plants/row. The plants were spaced at 50 cm between and 20 cm within rows. There were 13 treatments including control which were replicated 3 times in a randomised block design. Six insecticides namely, oxydemeton-methyl (Metasystox E. C), chlorpyrifos (Dursban E. C), dicrotophos (Bidrin E. C.), methyl-parathion (Metacid E. C.), endosulfan (Thiodan E. C.) and thiometon (Ekatin E. C.) were sprayed to drip-point at two concentrations viz. 0.03% and 0.05% actual ingredients. Control plots were sprayed with water.

The treated potato leaves were collected from plots 2 hrs after spraying and subsequently at different intervals till the toxic effect of most of the insecticides disappeared. One compound leaf plucked from each treated plot (representing each replication of each treatment) was kept inside the petridish pairs of 10 cm size every time. Wet blotting paper was provided inside the lower petridishes before keeping the treated leaves for maintaining their normal condition for 48 hours. Ten laboratory reared apterous adults of *M. persicae* were liberated in each replication (each petridish pair containing treated leaf) of each treatment. The petri dishes containing leaf and aphids were kept in an incubator at 22 ± 2°C for 48 hours after which mortality observations were recorded. Residual toxicity of the insecticides was compared on the basis of "PT" index method suggested by PRADHAN & VENKATRAMAN (1962).

RESULTS AND DISCUSSION

During the investigations average maximum and minimum temperatures were 14.0 and 6.0°C, respectively, while average relative humidity was 31.3%. There was no rain/snow fall during this period.

TABLE 1. Residual toxicity of deposits of some modern insecticides to apterous adults of *Myzus persicae* SULZ. on potato plants.

Treatment	% mortality* due to 0.35% insecticides						% mortality* due to 0.05 insecticides					
	First day	Last day	X	T*	P	PT	First day	Last day	X	T*	P	PT
Oxydemeton-methyl (Metasystox E. C.)	100.00	63.33	35+	90.12	35	3154.20	100.00	100.00	35+	99.05	35	3466.75
Chlorpyrifos (Dursban E. C.)	100.00	36.66	30	76.96	35	2693.60	100.00	40.00	34	87.71	35	3069.85
Dicrotophos (Bidrin E. C.)	100.00	36.66	25	63.66	35	2228.10	100.00	30.00	25	72.09	35	2523.15
Methyl-parathion (Metacid E. C.)	100.00	9.16	19	78.47	24	1883.28	100.00	2.50	21	56.77	35	1986.95
Endosulfan (Thiodan E. C.)	100.00	6.66	18	49.85	35	1744.75	100.00	33.33	20	56.52	35	1978.20
Thiometon (Ekatin E. C.)	100.00	5.00	13	50.57	29	1466.53	100.00	20.00	15	52.17	35	1825.95
Control (Water – spray)	0.00	0.00	—	—	—	—	0.00	0.00	—	—	—	—

*Average of three replications; + = upto the last observation date average mortality recorded was above 50%.
X = The number of days upto which at least 50% mortality was recorded; T = Average per cent mortality per day; P = Period in days upto which some mortality was recorded and P T = Residual toxicity index (P × T).

The results are shown in Table 1. It may be seen that two hours old deposits of all the insecticides in both the concentrations caused 100% mortality of *Myzus persicae*. Oxydemeton – methyl, chlorpyrifos, dicrotophos, methyl-parathion, endosulfan and thiometon have descending values of residual toxicity for their deposits.

It would be seen from Table-1 that the pattern of residual toxicity of all the insecticides remained the same at both the concentrations. All the insecticides were found effective against apterous adults of aphid, *M. persicae* under prevailing climatic conditions but oxydemeton-methyl, chlorpyrifos and dicrotophos were relatively persistent for longer period.

Acknowledgements:– The authors wish to thank Dr. S. K. PRASAD, Former Head of the Division of Entomology, Central Potato Research Institute, Simla – 171001 for the suggestions and facilities.

REFERENCES

ANONYMOUS (1971) Potato in India. *C. P. R. I. Tech Bull.*, No. **1**: 25–26.

MISRA, S. S. & K. D. VERMA (1974) Residual toxicity of some systemic insecticides to the apterous adults of *Myzus persicae* SULZ. infesting potato crop. *Indian J. Pl. Prot.*, **2**: 60–63.

NIRULA, K. K. (1962) Insecticidal control of the spread of leaf-roll and virus 'Y' in potatoes. *Indian Potato J.*, **4**: 10–16.

NIRULA, K. K. & R. KUMAR (1969) Soil application of systemic insecticides for the control of aphid vectors of leaf-roll and 'Y' viruses in potato. *Indian J. agric. Sci.*, **39**: 699–702.

PRADHAN, S. & T. V. VENKATRAMAN (1962) Integration of chemical and biological control of *Chilo zonellus* (SWINHOE) the stalk borer of maize and Jowar. *Proeedings of the Symposium on Advancing Frontiers of Life Sciences*, **19**: 119–125.