Pak. J. Agri. Sci., Vol. 30, No. 3, 1993

EVALUATION OF SOME COMBINATION INSECTICIDES AGAINST INSECT PESTS COMPLEX OF COTTON CV. NIAB 78

Sohail Ahmed & Mansoor-ul-Hasan
Department of Agri. Entomology,
University of Agriculture, Faisalabad

Comparative efficacy of six combination insecticides viz., Azocard, Pay-off plus, Laser, Mavrik-B, Deltaphos-R and Nurelle-D were tested at Toba Tek Singh during 1987. Azocard 44 EC reduced the jassid population to 79.0 and 75.7% after 48 and 96 hours of spray, respectively. All the insecticides were equal in performance in controlling white fly and thrips after 48 and 96 hours of application. Spotted bollworms infestation was the lowest in plots treated with Deltaphos-R. Yield of seed cotton was the highest from Laser 25 EC treated plots. At Faisalabad, cotton was the highest from Laser 25 EC treated plots. At Faisalabad, during 1988, six combination insecticides, similar to that at Toba Tek Singh. During 1987, except Nurelle-D was replaced by with Decis-D, were at par in controlling whitefly 48 and 96 hours after spray but significantly different in controlling jassid, thrips and bollworms. The highest yield of seed cotton was obtained with Deltaphos-R.

INTRODUCTION

Cotton crop is attacked by a number of insect pests of which jassid, whitefly, thrips and spotted and pink bollworms are very serious (Yunus, 1976). These insect species are appearing regularly on cotton from sowing to harvesting and account for a large share of crop loss. Whitefly and thrips are early season (May-June) pests while jassid and spotted and pink bollworms occur at a later stage of crop (Chaudhry, 1976). The insecticidal application from seedling to crop maturity has become an essential component of successful cotton production.

Systemic and pyrethroid insecticides are usually recommended for sucking insects and bollworms, respectively. Since both the sucking and bollworm insect pests appear concurrently, the individual application of aforementioned insecticides may hamper the population of one species while non-target species can increase at much faster rates. Therefore, need for such a chemical arises that proves effective for the whole complex. The best result of methamidophos, methomyl and Phosalon in combination with DDT against *Aphis gossypii* (Glov.) and other cotton pests has been obtained (Mundiwale *et al.,* 1983). Cypermethrin @ 30 g ha^{-1} combined with Triazophos @ 250 or Profenophos @ 300 g ha^{-1} was selected as the most effective proportion for control of cotton pests (Vaissayore, 1983). Qayyum (1987) reported that Fenom-N, Alamos-D, Baythroid TM and Polytrin-C tried @ 1.560, 2.500, 1.000, 1.250 and 0.625 g ha^{-1}, respectively gave better control of insect pests of cotton than that with Cymbush. The present study was conducted to find out the most effective combination (O.P and Pyrethroid) insecticides available in the market for the control of cotton insect pests.

MATERIALS AND METHODS

Six combination insecticides viz., Azocard 44 EC, Pay-off plus, Laser 25 EC,

Table 1. Effect of combination insecticides on insect pests complex of cotton (Toba Tek Singh, 1987)

	Dose (ml acre^{-1})	Reduction in population (%)						Spotted bollworm infestation (%)	Seed cotton (kg ha^{-1})
		Jassid		Whitefly		Thrips			
		48 hours	96 hours	48 hours	96 hours	48 hours	96 hours		
Azocard 44 EC	600	79.0 a	75.7 a	77.9 a	92.0 a	90.3 b	94.2 a	5.34 b	2239 a
Pay-off plus	500	78.9 a	75.2 a	74.3 a	75.4 b	90.9 ab	84.2 a	5.75 b	2153 a
Laser 25 EC	1000	78.4 a	74.3 a	73.1 a	79.4 ab	95.3 ab	94.5 a	5.75 b	2297 a
Mavrik-B	500	77.8 a	70.7 ab	79.9 a	58.8 a	92.9 ab	89.9 a	5.43 b	2146 ab
Deltaphos-R 350 + 10 EC	600	72.4 a	64.6 bc	68.9 a	77.7 b	96.6 a	93.0 a	3.65 b	2006 ab
Nurell-D 505 EC	400	70.6 a	58.9 c	75.4 a	72.6 b	5.0 ab	95.0 a	3.98 b	1810 b
Check	-	4.7 b	7.7 d	5.4 b	7.5 b	7.2* c	7.5 b	19.43 a	940 c

In each column, means having similar letter(s) are not significantly different at P = 0.05.

*Negative value showing an increase in population.

Table 2. Effect of combination insecticides on insect pests complex of cotton (Faisalabad, 1988)

	Dose (ml acre^{-1})	Reduction in population (%)						Spotted bollworm infestation (%)	Seed cotton (kg ha^{-1})
		Jassid		Whitefly		Thrips			
		48 hours	96 hours	48 hours	96 hours	48 hours	96 hours		
Azocard 44 EC	600	94.6 a	97.8 a	83.7 a	79.8 b	98.4 b	97.5 a	2.72 a	2136 a
Pay-off plus	500	91.2 ab	84.6 b	83.9 a	73.0 a	99.1 a	99.0 a	3.06 b	2190 a
Laser 25 EC	1000	87.9 ab	96.7 a	79.8 a	73.5 a	90.6 b	97.3 a	6.87 bc	2269 a
Mavrick-B	500	89.3 ab	94.0 a	73.8 a	77.5 a	94.2 ab	96.8 a	7.24 cd	2255 a
Deltaphos-R 350 + 10 EC	600	83.9 b	94.8 a	75.8 a	73.3 a	96.4 ab	92.6 ab	5.39 abc	2348 a
Decis-D 12.5 + 300 EC	400	93.1 a	92.4 ab	71.5 a	71.8 a	97.2 a	88.5 b	8.77 d	2259 a
Check	-	10.9 c	7.7 c	3.8 b	2.5 b	5.3 c	5.9 c	29.51 e	578 b

In each column, means having similar letter(s) are not significantly different at P = 0.05.

Mavrik-B, Deltaphos-R 350 + 10 EC and Nurelle-D 505 EC, Decis-D 12.5 + 300 EC were evaluated for their effectiveness against cotton insect pests on cotton, NIAB 78, in a farmer's field at Toba Tek Singh and Faisalabad during 1987 and 1988, respectively, following Randomised Complete Block. The treatments were replicated 4 and 3 times, with a plot size of 15.24 x 3.81 m, sprayed 5 and 3 times at Toba Tek Singh and Faisal-

abad, respectively. The Nurelle-D was replaced by Decis-D during 1988 trial and check plots were sprayed with water. The trials were sprayed at 15 days interval starting from July 15, 1987 and August 15, 1988 in Toba Tek Singh and Faisalabad, respectively. All agronomic practices were standard. Population of sucking insect pests was recorded 48 and 96 hours after insecticidal application from three leaves one each from upper, middle and lower portions of five randomly selected plants. Infestation of bollworms was recorded by counting damaged and healthy fruiting bodies of five randomly selected plants plot^{-1} at 7 days post-treatment intervals till the next application. Yield of seed cotton was recorded. The data were subjected to statistical analysis.

RESULTS AND DISCUSSION

The results (Table 1) show that all the insecticides were statistically equal in performance against jassid and whitefly after 48 hours and thrips after 96 hours of spray. Nurelle-D and Deltaphos gave significantly lower population of jassid, 58.9 and 64.6%, respectively after 96 hours post-spray interval compared to rest of the treatments. Azocard was statistically better in performance and at par with Laser only against whitefly 96 hours after spray. Deltaphos was statistically at par with other insecticides except Azocard in controlling thrips after 48 hours. Infestation of bollworms was equal in all the treatments, range being 3.65 to 5.75%. All the products gave similar yield of seed cotton (2006 to 2297 kg ha^{-1}) except Nurelle-D (1810 kg ha^{-1}) which was at par with Mavrik-B and Deltaphos-R. The results are partially in agreement with those of Qayyum (1987) and Vaissayore (1983) who stated that combination provided better control than the pyrethroid alone.

All the insecticides proved statistically similar in controlling whitefly, 48 and 96 hours post-treatment. Azocard and Decis-D remained statistically similar but differed significantly from Deltaphos-R and later was at par with Laser. Decis-D statistically at par with Deltaphos had significant differences with rest of the insecticides in controlling thrips 96 hours after spray. Bollworms infestation was the lowest in plots treated with Azocard (2.72%) having non-significant difference with Pay-off (3.06%) and Deltaphos (5.39%) while rest of the insecticides were identical. All plots treatment with insecticides gave statistically similar yield of seed cotton but significantly higher than that from the check.

It is clear from Tables 1 and 2 that Azocard gave better control than other combination insecticides. Azocard is a combination of Cypermethrin and monocrotophos (marketed under the trade name Azodrin). Azodrin has not only systemic action but also remains on plant surface for sufficient to kill immediately the insects crawling over the surface whereas other combinations contain O.Ps. of dimethoate, triazophos, chloropyriphos and thiometon groups with systemic or contact activity only.

Since the jassid population increases after rains and often, whitefly and thrips also occur at a time with bollworms during August and September, hence one or two applications of combination insecticides spray will be useful during this period.

REFERENCES

Chaudhry, Q.G. 1976. Pest control in cotton production. pp: 114-118. In: Proc. Cotton Production Seminar. ESSO Pak. Fert. Co. Ltd., April 29-30, 1976. Sukkur.

Mundiwale, S.K., U.B. Men, V.S. Govindwar and M.N. Borle, 1983. Efficacy of five insecticides alone and in combination with DDT against cotton pests. Indian J. Entomol. 45: 282-285. (Rev. App. Entomol. (A), 72: 4758; 1984).

Qayyum, S. 1987. Comparative efficacy of some insecticidal combinations against insect pests of cotton. M.Sc. Thesis, Dept. Agri. Entomol., Univ. of Agri., Faisalabad.

Vaissayore, M. 1983. Pyrethroid-Organophosphate combination for protection of cotton crop. Selection of the most effective proportion. Cotton Fibre Tropic. 38: 269-273. (Rev. App. Entomol. (A), 12: 3972; 1984).

Yunus, M. 1976. Loss of cotton crop due to insect pests. p. 105-113. In: Proc. Cotton Production Seminar. ESSO Pak. Fert. Co. Ltd., April 29-30, 1976. Sukkur.