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Short Communication

EFFICACY OF PETKOLIN AND PHOSALONE MIXTURE AGAINST COTTON PEST COMPLEX IN MULTAN

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Pesticidal potentialities of Petkolin against different pests[1-4] of cotton crop have been reported earlier. Results have also been reported of the joint action of Petkolin with methyl Parathion and Diazinon against two pests[5] of cotton crop in Hyderabad division. The above trials were conducted on the basis of preliminary laboratory findings that showed that Petkolin was compatible with some of the chlorinated and phosphatic insecticides[6] when tested against houseflies, *Musca domestica* L.

In view of the compatibility of Petkolin with other insecticides in the laboratory and field conditions and the reported activity of DDT–Phosalone against different pests of cotton, the present investigation was undertaken to evaluate the compatibility of Petkolin with Phosalone against cotton pest complex in Multan division. These trials were conducted jointly by the P. C. S. I. R. and May and Baker, Lahore.

Materials and Methods

The experiment was conducted on AC 134 variety of cotton at two sites in the Multan division the first experimental area was located at Bheni model farm, Multan and the second was selected at Kabirwala in the Khanewal district. The total experimental area at the site 1 was 3 kanals, while at the second site it was 1½ kanals. At both the sites three replications were kept in a randomized block design and the spraying was done with a 'Solo' Knapsack power sprayer. Untreated check was also kept with each experiment.

The pests encountered at the two experimental sites were jassids, *Empoasca devastans;* white flies, *Bemisia gossypii;* thrips, *Thrips tabaci* and the two bollworms, i.e. the spotted bollworm, *Earias fabia* (stoll) and the pink bollworm, *Platyedra gossypiella* (Saunders). The overall infestation of pests was considerably low, especially the population of thrips was insignificant and hence it was not included in the observations.

Two doses of Petkolin+Phosalone mixture, i.e. 40 oz and 30 fl oz per acre were tested. DDT+Phosalone was used at the rate of 60 fl oz per acre while Dimecron was used at the rate of 4–6 oz per acre. The formulations of the above insecticides have been shown in Table 1.

The quantity of water used for spraying the insecticidal emulsions varied between 15–20 gallons per acre depending upon the height and foliage of the crop.

Pretreatment observations were taken 24 hr before spraying for all the insects while the post treatment counts were taken after 72 hr in the cases of jassids and white flies and at 15–16 day intervals for bollworms at both the experimental sites. For jassids and white flies the observations were recorded by counting the insects on one hundred leaves per plot prior to and 72 hr after spraying while one hundred bolls were counted from one plot for recording the bollworm infestation.

In all the cases the counting was done on five plants per row by examining five leaves and five bolls from the same plant and moving diagonally across the four central rows of each plot. The spraying was done at an interval of 14–16 days approximately. Four sprays were done at site 1 and three at site 2. The yield of cotton seed was taken for each plot. Three pickings were made at site 1 and four at site 2.

Results and Discussion

The percentages of control of jassids and white flies have been shown in Table 2 and the population fluctuation of bollworms before and after insecticidal applications has been shown in Table 3.

Jassids. The incidence of this pest was very low, the maximum count being not more than 60 per 100 leaves at any site. The efficacy of Petkolin+Phosalone mixture at the rate of 40 fl oz per acre was comparable to that of DDT+Phosalone mixture at site 1 whereas at site 2 the latter gave a better control of jassids than the former. The lower dose of Petkolin+Phosalone mixture like Dimecron did not give satisfactory control of jassids at the two sites.

TABLE 1. THE FORMULATIONS OF PHOSALONE AND PETKOLIN USED DURING THE EXPERIMENTAL TRIALS.

Insecticides	Formulation/composition (w/v)	Dose/acre	(a.i.)/acre (oz)
Petkolin+Phosalone (Zolone)	Phosalone 15% Emulsifier 10% Petkolin added to 100% by volume (108%)	(i) 40 fl oz (ii) 30 fl oz	(i) 42+6 (ii) 31+4
DDT+Phosalone (Zolone) (Zolone DT)	Phosalone 15% DDT 30% Emulsifier 55%	60 fl oz	18+9
Dimecron	100% E.C.	4–6 oz	6

White Flies. This pest appeared by the middle of August. The level of infestation of this pest was also low at the time of these trials. The higher dose of Petkolin+Phosalone mixture gave up to 80% mortality, while at the lower dose this mixture was not effective in controlling this pest. Similar was the case with Dimecron. Phosalone+DDT mixture gave the best control of this pest at the two sites.

Bollworms. Maximum control of bollworms was achieved with DDT+Phosalone mixture. The total percentage of infestation in such plots was 23% as compared to 35 and 47% respectively in the two test doses of Petkolin+Phosalone mixture. In case of Dimecron the percentage of infestation was 46%.

TABLE 2. CONTROL OF JASSIDS AND WHITE FLIES AFTER TREATMENT WITH DIFFERENT INSECTICIDES.

Insecticides	Dose/acre (fl oz)	Percent mortalities			
		Site 1		Site 2	
		Jassid	White flies	Jassid	White flies
Petkolin+Phosalone	40	88	79	78	80
Petkolin+Phosalone	30	61	53	75	19
DDT+Phosalone	60	91	92	90	82
Dimecron	4	65	54	47	5·4
Untreated check	—	Increase 13·1%	Increase 66%	Increase 48%	Increase 33%

TABLE 3. CONTROL OF BOLLWORMS (% INFESTATION) AT MULTAN (SITE 1).

Insecticides	Dose/acre (fl oz)	Date of application prior to infestation	Date and degree of infestation at the time of subsequent sprays		
			11.9.1969	27.9.1969	11.10.1969
Site 1					
Petkolin+Phosalone	40	21.8.1969	4	18	13
Petkolin+Phosalone	30	21.8.1969	2	23	22
DDT+Phosalone (Zolone+DT)	60	21.8.1969	1	15	7
Dimecron	4	21.8.1969	1	25	20
Control	—	—	4	39	31
Site 2			25.9.1969		
Petkolin+Phosalone	40	23.8.1969 9.9.1969	6		
Petkolin+Phosalone	30	23.8.1969 9.9.1969	4		
DDT+Phosalone (Zolone+DT)	60	23.8.1969 9.9.1969	3		
Dimecron	6	23.8.1969 9.9.1969	15		
Control	—	—	23		

TABLE 4. YIELD DATA IN POUNDS (MULTAN SITE 1).

Insecticides	Dose/acre (fl oz)	Pickings of cotton seeds			Total yield for 3 kanals	Yield cotton seed per acre	Yield over control(%)
		First	Second	Third			
		23·10·69	13·11·69	3·12·69			
Site 1							
Petkolin+Phosalone	40	148·5	268	135	552	1472	7
Petkolin+Phosalone	30	139·5	242	143	526	1403	2
DDT+Phosalone (Zolone+DT)	60	168·0	318	125	611	1629	18
Dimecron	4	166·5	243	108	518	1381	Equal to control
Control	—	181·5	223	113	518	1381	—

Site 2

Insecticides	Dose/acre (fl oz)	Pickings of cotton seeds				Total yield for 1½ kanals		Increase over control (%)
		First 26·10·69	Second 7·11·69	Third 23·11·69	Fourth 7·12·69			
Petkolin+Phosalone	40	41	49	72	58	220	1100	13
Petkolin+Phosalone	30	40	54	50	47	191	955	Decrease
DDT+Phosalone (Zolone+DT)	60	42	67	74	65	248	1240	27
Dimecron	6	20	70	67	64	221	1105	13
Control	—	37	56	57	45	195	975	—

Yield. At site 1 there was an increase of 2–7% respectively per acre in the yield of cotton seed with the two formulations of Petkolin+Phosalone combinations, whereas the yield of Dimecron was much less than the above combination and was comparable to the control. The maximum yield was achieved with DDT+Phosalone mixture resulting in an increase of 18% over the control.

At the site 2 the higher dose of Petkolin+Phosalone mixture gave an increase of 13% which was comparable to that of Dimecron. The lower dose of Petkolin+Phosalone mixture, i.e. 30 fl oz showed a decrease in the yield per acre. However DDT+Phosalone mixture gave the best results and an increase of 27% in they yield was achieved.

It was, therefore, concluded from the above trials that Petkolin+Phosalone mixture at the rate of 40 fl oz per acre gave better results than Dimecron against the pests encountered during the season. DDT+Phosalone mixture, however, proved to be the best combination for all the three pests.

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