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TOXICITY OF PETKOLIN-M IN COMPARISON WITH OTHER PESTICIDES AGAINST COTTON JASSIDS IN HYDERABAD REGION

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Petkolin-M alone as well as in combination with Methyl-parathion (Petkolin-MN_I) and Diazinon (Petkolin-MN_2) gave effective control of mites and jassids on cotton crop. Petkolin-M, Petkolin-MN_I and Petkolin-MN_2 killed 91%, 100% and 100% mites respectively. Petkolin-M, Petkolin-MN_I and Petkolin-MN_2 gave 93% to 94%, 100% and 100% mortality of jassids respectively after 24 hr of treatments. Petkolin-M was found compatable with Methyl-parathion and Diazinon.

In recent years, Petkolin[1,2] has been tested against a variety of agriculture pests like mites,[3] cotton leaf roller, sugar-cane pyrilla, maize borers, datepalm scales,[4] pink boll worm, rice borers, aphids[5] and has been found effective to control them. The effective dosage has been found to range from 1.6 lb to 3 lb active ingredient per acre. Later on Petkolin was modified by adding 1% additive in petroleum before subjecting it to the process of chlorination and it was named as Petkolin-M.

Petkolin-M was found more effective than Petkolin against insects in laboratory as well as in field conditions and safer than many other chlorinated pesticides.[6,7] Therefore, it was decided to test its efficacy alone as well as in combination with other pesticides on large scale in the field against mites (*Tetranychus telarius* (L) and jassids (*Empoasca devastans*) attacking cotton crop. The experiment was conducted two months earlier before picking at the time when jassid and mite population was on the peak due to favourable conditions of humidity and temperature.

The pesticides used were Petkolin-M, Petkolin MN_I (Petkolin-M (2 lb) + Methyl-parathion (0.25 lb). Petkolin MN_2 (Petkolin-M (2 lbs) + Diazinon (0.25 lb), Toxaphene, containing 14% Methyl-parathion, Diazinon, Methyl-parathion and Dimecron. The experiments were conducted on two sets of plots measuring 0.12 acre and half an acre to determine the effective toxic dose of Petkolin-M alone and in combination with Methyl-parathion and Diazinon in Hyderabad region.

Materials and Methods

In order to determine the efficacy of different pesticides against jassids and mites on cotton, two sets of experiments were designed. In the first set the plot-size was kept 0.12 acre and in the second half an acre.

First Set.—In the first set each treatment was replicated 3 times. Knapsack power sprayer was employed for the spraying. 3 lb active ingredient of Petkolin-M and 2.25 lb active ingredient both of Petkolin MN_I and Petkolin MN_2 were used. Pesticide emulsions were sprayed uniformly on the crop. Pretreatment observations of mites and jassids were recorded on 20 different leaves taken at random from each plot. Posttreatment observations after 24 hr and 48 hr were taken in the same way.

Second Set.—Large scale field trial of Petkolin-M, Petkolin MN_I, Petkolin MN_2, Toxaphene, Methyl-parathion, Dimecron and Diazinon was conducted against jassids (*Empoasca devastans*) on cotton crop in Hyderabad region. An area measuring 16 acres was selected for the purpose. The area was divided into 32 sub-plots of $\frac{1}{2}$ acre each. Layout of the experiment was randomised block design with four replications.

Petkolin-M, Petkolin MN_I, Petkolin MN_2, Toxaphene, Methyl-parathion, Dimecron and Diazinon were used at the rate of 3 lb, 2.25 lb, 2.25 lb, 2 lb, 12 oz, 8 oz and 12 oz respectively. Jico minor power sprayer with a tank capacity of 15 gallons was used for spraying. Great care was taken to avoid contamination of one pesticide with the other by washing the tank each time before using it again. Pesticides were sprayed in such a way as to give a thorough cover of the pesticide emulsions to plants. Pretreatment observations of jassid population were recorded by counting the number of jassids on 50 leaves of each treatment taken after 24 hr, 48 hr and 72 hr of spraying. The mortality percentage of each treatment was calculated separately.

Results and Discussion

Results of the experiments conducted showed that Toxaphene, Methyl-parathion, Dimecron, Diazinon, and Petkolin-M alone as well as in

combination with Methyl-parathion and Diazinon have been found effective in reducing the mite and jassid population. The mortality percentages of mites and jassids obtained due to pesticide treatments in the two experiments are given in Table 1 and Table 2.

Table 1.—Showing Mortality Percentage of Petkolin-M, Petkolin-MN_1 and Petkolin MN_2 in the First Set of Experiment.

Pesticide	Dose (a.i.) lb	Percent mortality	
		Mites	Jassids
Petkolin-M	3		
24 hr		91.1	93.3
48 hr		88.8	82.0
Petkolin MN_1	2.25		
24 hr		100	100
48 hr		98.6	100
Petkolin MN_2	2.25		
24 hr		100	100
48 hr		98.6	100
Control			
24 hr		16.6	20.0
48 hr		15.0	21.5

Table 2.—Showing Mortality Percentage of Jassids on Cotton Crop in the Second Set of Experiment.

Pesticides	Dose (a.i.) lb	Percent mortality		
		24 hr	48 hr	72 hr
Toxaphene 80% (containing 14% Methyl-parathion)	2	94.8	93.2	94.5
Methyl-parathion 50%	0.75	99.3	99.3	100
Dimecron 100%	0.5	98.6	99.4	100
Diazinon 50%	0.75	98.0	99.7	100
Petkolin-M 40%	3	94.4	93.9	91.7
Petkolin-MN_1	2.25	99.3	96.9	98.7
Petkolin-MN_2	2.25	96.1	97.3	97.9
Control		20.0	23.0	21.0

In the first set of experiment, Petkolin-M Petkolin MN_1 and Petkolin MN_2 proved effective against mites and reduced the population significantly giving, 91.1%, 100% and 100% mortality respectively after 24 hr of treatment. The jassid population was completely checked by Petkolin MN_1 and MN_2, both giving 100% mortality after 24 and 48 hr of spraying.

In the second experiment, Methyl-parathion, Dimecron and Diazinon gave 100% mortality after 72 hr of treatment, while Toxaphene containing 14% Methyl-parathion, and Petkolin-M alone gave 94.5% and 91.7% mortality respectively after 72 hr of spraying. Petkolin-M which has already been found effective for the control of a large variety of insect pests *viz.* cotton leaf roller, sugar-cane *Pyrilla*, rice borers, aphids, sugar-cane borers, has also given effective control of mites and jassids.

The plots treated with Petkolin-M did not show any phytotoxicity and the general appearance of the crop improved after Petkolin-M treatment.

The attempt to evaluate the compatibility of highly toxic insecticides like Methyl-parathion and Diazinon with Petkolin-M showed that the addition of one third the normal dose of Methyl-parathion and Diazinon separately with two third of the normal dose of Petkolin-M enhanced the toxic effects of Petkolin-M and showed that Methyl-parathion and Diazinon are both compatible with Petkolin-M and the minimum effective dose of the mixture was reduced to 2.25 lb in comparison with 3 lb active ingredient of Petkolin-M alone.

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