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EVALUATION OF ATTRACTICIDE FOR THE CONTROL OF PINK BOLLWORM*

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The efficacy of attracticides comprising gossyplure adjuvants and cypermethrin was evaluated in comparison with a conventional insecticide (fenvalerate) for the control of pink bollworm, *Pectinophora gossypiella*, Saunders (Lepidoptera: Gelechiidae). The results revealled that attracticide treatment was only comparable with conventional insecticide treatment in terms of the effectiveness of larval control. However when the male moth population was monitored using delta traps baited with gossyplure in the treated plots, a reduction of 80 % in attracticide treatment over insecticidal treatment was observed.

Key words: Pink bollworm; Attracticide; Insecticide.

INTRODUCTION

The mating disruption technique using a sex pheromone, gossyplure, has been employed for the control of pink bollworm with certain degree of success [4,6,7,10 11]. Critchley *et al.* [1] observed that early-season pheromone application was effective for the control of pink bollworm and less so when the pheromone was applied towards the end of the season They demonstrated that towards the end of the cotton season, insecticides were more effective than the pheromone. Legner and Medved [8] tested various combinations of permethrin or parasites with the gossyplure and reported that a combination of permethrin with gossyplure was the best in controlling pink bollworm. Lingren *et al.* [9] observed that when gossyplure was mixed with an adjuvant and an insecticide and sprayed in strips on cotton foliage it kept the population of pink bollworm below economic levels for three weeks. They reported that adjuvants stimulate the adult feeding of both sexes and act as a slow-release formulation to extend the life of the pheromone.

The present investigations were, therefore, conducted to evaluate the effectiveness of an attracticide in comparison with conventional insecticidal spray for the control of pink bollworm of cotton.

MATERIALS AND METHODS

Qalandri, a commercial variety of cotton, was sown in four different plots (0.14 ha each) situated on the same locality and each plot was further sub-divided into three plots to make four replications. In the first plot an attracticide comprising gossyplure (1 . 1 mixture of Z,Z- and Z,E-isomers of 7, 11 hexadecadienyl acetate) 2 mg + cypermethrin 10 EC 400 ml and adjuvant 900 g/acre mixed in 13.5 litres of water was sprayed with a knapsack sprayer. The spray was performed in strips (2 x 2 m) at 3-week intervals keeping a distance of 5 metres from between strips. The adjuvant used in the study contained cottonseed flour (63 %), cottonseed oil (11.97 %), sugar (25 %) and a surfactant (0.03 %). A total of five strip sprays was done during the season starting from the 2nd week of July.

In the second plot fenvalerate (sumicidin, 20 % EC) was sprayed at the recommended dose of 280 ml per acre in 100 litres of water at fortnightly intervals. Thus a total of 6 sprays was done during the season strarting from the 2nd week of July. The third plot was kept as control and no treatment was given. The effectiveness of these treatments was measured by monitoring the male moth population using two gossyplure baited traps at fortnightly intervals and also by observing the larval infestation in the flowers and green bolls at weekly intervals from each treatment. Percentage infestation in flowers and green bolls was observed from each plot separately. Flower infestation was observed from 5 randomly selected plants from each sub-plot. Boll infestation was recorded by 25 randomly picked bolls from each sub-plot. Thus a total of 100 bolls was collected and brought to the laboratory for dissection and examination of pink bollworm larvae.

RESULTS AND DISCUSSION

The percentage of pink bollworm infestation in flowers and green bolls revealed that the mean larval infestation in attracticide treatment did not differ statistically from

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that of insecticide treatment at 1 % level of significance (Table 1). In control the larval population in flowers and green bolls was very high and differred significantly from attracticide as well as insecticide treatment. The data on monitoring the moth population (Table 2) indicated that male moth population was significantly reduced in plots treated with attracticdie treatment. In the case of attracticides treatment a reduction of 80 % in moth population was observed over insecticide treatment.

Table 1. Comparative effectiveness of attracticide and insecticide treatments in controlling pink bollworm during 1984 and 1985.

Spray treatments	Mean larval infestation** %	
	Flowers	Green bolls
Attracticide*	3.90 a	8.55 a
Insecticide (20 % EC sumicidin)	3.75 a	8.89 a
Control (no treatment)	6.45 b	30.27 b

* Contains gossyplure, adjuvant and ripcord.
** Means not sharing same letter differ at $P \geqslant 0.01$.

Table 2. Pink bollworm male moths captured in gossyplure baited traps from plots of different spray treatments during 1984 and 1985.

Spray treatment	Total No. of moths captured	Reduction percentage over control	Reduction percentage over insecticide treatment
Attracticide*	158	91.04	79.87
Insecticide (20 % EC sumicidin)	785	55.49	–
Control	1764	–	–

* Contains gossyplure, adjuvant and ripcord.

In the present studies attracticide treatment was found comparable with conventional insecticidal spray treatment in controlling the larval population of pink bollworm. Our results are in close conformity with those of Critchley *et al.* [2]. They reported that various synthetic pheromone formulations were comparable with insecticide treatment in controlling the pink bollworm larval population. A reduction of 80 % in male moth population which has been recorded in attracticide treatment over insecticide treatment may be attributed to the fact that male moths were attracted to droplets of attracticide and killed by contact with insecticide through mating attempts. We found that attracticide treatment remained equally effective with insecticide treatment throughout the cotton season. It is, therefore, inferred that adjuvant has prolonged the effective life of the pheromone. Further in order to increase the efficiency of attracticide for the control of pink bollworm it is advisable to use 60 : 40 ratio of ZZ and ZE isomers of gossyplure in the early season while the ratio should be 1:1 in the late season application as advocated by Flint *et al.* [5].

Although the insecticidal spray and attracticide treatments were comparable in reducing the larval infestation of pink bollworm, yet the attracticide treatment has an advantage over conventional insecticide application in that it is less laborious, less hazardous and has little adverse effect on other organisms.

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