

STUDIES ON BOLLWORMS INFESTING COTTON IN SHARKIA GOVERNORATE, EGYPT

ABSTRACT

Certain ecological and control studies on both pink and spiny bollworms, *Pectinophora gossypiella* (Saund.) and *Earias insulana* (Boisd.), respectively infesting cotton plants were conducted in Belbeis district, Sharkia Governorate during three successive years (1997-1999). Moreover, laboratory toxicological studies on some insecticides were executed in the laboratory of plant protection Institute (Sharkia Branch) during 2000/2001 at Zagazig. The main lines of these studies can be summarized as follows:

1- Field Ecological and Control Studies

1.1- Flight activity of male moths

The first appearance of male moths of both pink and spiny bollworms in specific sex pheromone traps was detected through the first quarter of the investigating year and varied from one year to another. After the insect initial incidence, it fluctuated in numbers to show different numbers of population activity peaks ranging from 9 to 15 peaks for pink bollworm and from 11 to 13 for spiny bollworm according to the investigating year. The highest levels of maximum abundance of 836.00, 238.66, 359.66 male moths/traps for pink bollworm and 127.66, 96.66, 47.66 for

spiny bollworm were occurred on 11th of September, 22, 15th of October and 29th, 1st, 15th of October in the first, second and third years; respectively.

According to the effect of temperature, relative humidity and night period on the seasonal population fluctuations of pink bollworm, these factors can be arranged descendingly as follows: temperature, night period and relative humidity. But in case of spiny bollworm, the order was different and varied from one year to another showing the following arrangement: night period, temperature and relative humidity in 1997 and 1998 years, whereas in 1999 a switch in position between the first and second factors was taken place.

1.2- Seasonal population fluctuation of larvae

Cotton green bolls began to be infested with pink bollworm larvae in the end of June and the beginning of July, whereas the initial incidence of the spiny bollworm occurred lately by about four weeks showing relatively low numbers. After the larvae first appearance, they gradually increased in numbers to reach the highest abundances of 30.33, 31.33 larvae/33 bolls for pink bollworm and 31.17, 30.19 for spiny bollworm, respectively at the end of cotton growing season (19th of September). As regards, the impact of some weather factors on pink bollworm larval population, it is evident that the most effective factor was temperature, whereas the lowest one was relative humidity. In case of spiny bollworm, sunshine period

proved to be the most effective factor and the lowest one was relative humidity in the first season and temperature in the second.

1.3- Relationship between pheromone trap catch and cotton green bolls infestation

Simple correlation coefficients between weekly mean numbers of male moths captured in the sex pheromone traps and the corresponding degree of green bolls infestation measured as either % of bolls infestation or larval population density per 33 bolls were calculated during 1998 and 1999 cotton growing seasons in untreated and treated plots with S-fenvalerate, profenofos and thiodicarb in six programs for both pink and spiny bollworms. The obtained results indicated that all coefficients proved to be positive and statistically significant and highly significant for the two studied infestation parameters for each of pink and spiny bollworms during both first and second seasons for a period of 13 weeks from 26th of June to 19th of September.

1.4- Evaluation of some insecticides against pink and spiny bollworms

Three conventional insecticides i.e., S-fenvalerate (F), profenofos (P) and thiodicarb (T) were evaluated against both pink and spiny bollworms on cotton plants using six different spray programs i.e, spraying each of the tested insecticides

individually in one spray (F,P,T), spraying S-fenvalerate in the first spray and followed by profenofos in the second (F+P), spraying profenofos in the first spray and followed by thiodicarb in the second (P+T), and spraying S-fenvalerate in the first spray and followed by profenofos in the second spray and then thiodicarb in the third (F+P+T). These programmes were started when percent of bolls infestation reached 1,3,5,7 and 9% through two consecutive cotton growing seasons. F+P and F+P+T spray programs seemed to be the most efficient against pink and spiny bollworms as cotton plants treated with them showed low percents of bolls infestation with each and yielded high amounts of seed cotton. Cotton plants treated by different spray programs at 5% bolls infestation were less infested by both bollworms and gave the highest yield compared either with other tested levels or with check experiment. Consequently, F+P program can be recommended to control pink and spiny bollworms in cotton fields and the third spray of the other program can be excluded and this is very useful for reducing control costs as well for increasing activity of parasitic and predaceous natural enemies of insects and true spiders. All tested programs had an adverse effect on predaceous arthropods prevailing in cotton fields.

2- Laboratory Bioassay Studies on Pink Bollworm

According to toxicity data of three conventional insecticides, S-fenvalerate was the most toxic compound against newly hatched larvae as compared with profenofos and

thiodicarb. By comparing treated larvae with check individuals, the latent effects on some biological aspects of the tested insects can be clarified in the following points:

- 1- Both insecticides and concentrations used from each caused a considerable shortness in the durations of egg, larval, pupal and adult stages. The same effect was also detected with female oviposition periods (pre-oviposition and post-oviposition).
- 2- Weight of both 4th instar larvae and pupae resulting from treated larvae was greatly reduced by tested insecticides and concentrations as compared with untreated individuals.
- 3- Insecticidal treatments in different concentrations had a great depressing influence on some biological characters such as percent of pupation from alive larvae after treatment, sex ratio of adults (% males), hatchability percentage of eggs deposited by females resulting from treated neonate larvae and their fecundity of eggs. On the other hand, these treatments did not show a noticeable impact on the percentage of adult emergence from pupae forming from alive larvae after treatment.
- 4- The quantal graded scoring of abnormality for larval-adult transformation showed six different scores. S-fenvalerate did not show any malformed individuals. Profenofos compound proved to have a higher teratological effect on pink bollworm than that of thiodicarb.

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