

Biocontrol of Pest from a chemical Biobit (Benz- isothiazol-one-bit)

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ABSTRACT

We have investigated a chemical Biobit for controlling a pest Antigastra catalaunalis, which spreads diseases on 'TILL' (sesame indicum). TILL is an industrial crop for oil production. We are used two popular methods for investigated Biobit are as follows:

- 1. Leaf dip method*
- 2. Residue film method.*

I. INTRODUCTION

Sesame (Sesame indicum) as an industrial crop for oil production with high nutritive and economical values. It is commonly known as 'TILL' Sesame is known as the queen of oil. Hence, this oil is used by human beings. Like other plant sesame is attacked by a large number of insects pests through out the crop. Season of which sesame leaf roller and capsule borer, Antigastracatalaunalis (duponchel) is the most disruptive and causing heavy yield loss in India. It can cause yield loss upto 90% to get the maximum profit from the productivity of TILL a large number of insecticides and other control of the leaf webber and capsule borer, Antigastracatalaunalis this investigation is aimed to explore different bio-ecological aspects of Antigastracatalaunalis and their control biologically. A perusal of the available literature has revealed that antigastra catalaunalis is a major pest of sesame in India it cause major loss of sesame crop hence, its lifecycle was studied.

II. METHODOLOGY

The insect fauna of sesame crop was detected by regular inspection of the sesame crop standing in rearing plot from recording presence of insects on the crop plants from 'july to november'. The crop was inspected at fortnightly intervals during the above observations, adult, larvae and nymphs of different pest species were observed. Many insects larvae and nymphs which could not be identified to their species were further rearing until their adults were formed. During each fortnight observations, the addition the deletion and fresh appearance of pest in pest complex were recorded. Similarly values were obtained for all the insects present in the crop at each observation date and the incidence of a pest was determined as under

$$\% \text{incidence} = \frac{\text{Available no. of infested plants in unit area}}{\text{Available no. of total plants in unit area}} \times 100$$

2.1 BIO-Control of *Antigastra catalaunalis* :

To control the pest, biobit-wetable powder (**BIOBIT**→1,2,-BENZISOTHIAZOL-ONE BIT) containing 25x100000000 viable spores per gram of final product of B.THURINGIENSIS was used in this study. Many entomologist used biobit to control different lepidopterous pests hence its efficacy as controlling agent has already been proved. 1,2 benzisothiazol onebit is a white to off white fine, crystalline powder. Biobit was obtain in puriform and the stock solution used in this investigation was prepared distilled water which gave the concentration of one percent. We treated with different concentrations of biobit by two methods , leaf dip method and residue film method .

- (a) **Leaf dip method:** In this method of treatment the uniform size of tender leaves were treated with each concentration of biobit and these treated leaves were used as food of larvae of A.CAT.
- (b) **Residue film method:** In this method of treatment 1-2 hrs old moth were exposed to a thin film of residue of a concentration of biobit . Adults were left in petridishes having thin film of biobit for 24 hrs. Studies related to bio-control of A.CATALAUNALIS were conducted experimentally under laboratory condition of temperature and relative humidity. These studies were carried under following headings
- The effect of biobit on growth of A. CAT.
 - The effects of biobit on development
 - The effects of biobit on reproduction
 - The effects of biobit on sex specific sterility
 - The compatibility of biobit with some chemicals insecticides.

2.2 Effect of Biobit on growth of *A. catalaunalis* :

This was studied under two different conditions of treatment. This was studied by employing larvae on the leaf treated with different concentration of biobit. Biobit-preparations on the larvae growth under this treatment was studied by five experiments twenty larva per replicate were reared on tender leaves of sesame till the 16th day of development. The weight of these larvae were recorded on 5th ,10th ,15th day of their larval duration. The larvae obtained from the adult treated with different strength of biobit by the residue film method were employed for evaluation of their growth. This aspect was studied by applying the biobit leaf dip method and residue film method the adult were treated by topical method while larvae by leaf dip method. Sixty larvae were selected at random from the laboratory stock and were treated with a strength of a biobit by leaf dip method . The previously mentioned study was conducted with reference to each strength of biobit and records identical to a mentioned were obtained . 20 pairs of adults selected and random from the rearing stock and were treated with a strength of biobit for 24 hrs. in petridishes and then after they were maintained in glass chimneys for. Sixty larva were selected these larvae made three replicates and were reared to obtain their pupae and adults. This was studied experimentally with hatched larvae obtained from females fed on strength of biobit were employed experimentally. The experiment was further extended for recording the life span of male and female moths.

Beside the above records under both method of application of biobit the records pertaining to net mortality was obtained as suggested by Abbat (1925) as follows :

$$\% \text{ Net Mortality} = \frac{\% \text{ Mortality in test} - \% \text{ Mortality in normal}}{100 - \% \text{ Mortality in normal}} \times 100$$

2.3 Effect of Biobit on reproduction: The reproduction in *A. catalaunalis* under influence was studied under two headings 1) Effect of Biobit on fertility and periods and fecundity. 2) Effect of Biobit on fertility and incubation period. The pre-oviposition and oviposition periods and the no. of eggs laid by a female were studied separately by applying biobit to larvae and adults as described under. Ten males and then females were obtained from females laid eggs for the first time pre oviposition period was recorded total no. of eggs was contained the above study was made separately for each strength of biobit and above mentioned records were obtained for them. Ten females along with ten males were selected at random from the laboratory stock both male and female were compelled to contact a thin film of strength of biobit for 24 hrs. The above mentioned study was conducted separately for all concentrations of biobit used in this investigation and records were obtained .

III.OBSERVATION

Sesame, *sesame indicum* linn is a major oil seed crop of orai (jalaun district) of uttar Pradesh. But its production is very low in this district. Among the various factors responsible for low yield, damage due to insect pest of sesame crop in field condition. Among many pests , leaf roller/capsule borer *A. catalaunalis* is considered as key pest of regular occurrence. For the control of *A catalaunalis*, the administration of different concentrations of biobit was done by leaf dip method and residue film method . to evaluate te effect of biobit on the growth and development several experiments were done in laboratory . sterilizing effects on male and female *A CATALAUNALIS* also studied experimentally. Effect of chemical insecticides and efficacy of biobit in combination with chemical insecticides against 5 days old larvae of *A catalaunalis* also studied. The result obtained in different experiments .

Table 1: Effect of different concentration of ‘Biobit’ in larva of *A. catalaunalis*:

Mode of treatment	Concentration (%)	Larvel biomass_S.E. on		
		4 th day	8 th day	12 th day
L. D. M .	0.10	2.92-0.13	16.38-0.3	58.46-0.58
	0.50	1.89-0.16	7.67-0.26	39.48-0.48
	1.00	1.182-0.10	5.66-0.26	23.26-0.68
R. F. M.	0.10	2.96-0.10	17.78-0.24	60.49-0.30
	0.50	2.06-0.14	9.24-0.14	40.48-0.34
	1.00	1.24-0.15	6.04-0.24	24.85-0.77

Table 2: Effect of different concentration of ‘Biobit’ in adult of *A. catalaunalis*:

Mode of treatment	Concentration (%)	Weight (mg)_S.E. on		
		Pupa	Male	Female
L. D. M .	0.10	112.46-32	69.48-0.38	75.66-0.46
	0.50	91.57-0.32	48.64-0.50	49.46-0.42
	1.00	54.46-0.22	36.63-0.44	42.66-0.83
R. F. M.	0.10	122.46-0.42	74.42-0.62	78.69-0.299
	0.50	94.37-0.21	49.54-0.82	58.68-0.74
	1.00	58.83-0.13	40.78-0.92	43.26-0.63

IV. RESULTS AND DISCUSSION

Results of the present investigation have been present in tables 1 to 2 . The frequent inspection and surveys of sesame crop during three continuous years at insectory, D.V. college , Orai (Jalaun district) revealed that 28 insects pests infesting late sown kharif and semi-rabi sesame crop. It was recorded for three continuous years and the related observations showed tha *A.CATALAUNALIS* was the most regular pest in the sesame crop it prevailed in the crop from July to December its incidence was comparatively high in which it varied from 9.60 to 49.80% and from 8.40 to 43.64% respectively . Larvae of the control experiment accumulated 3.26 mg. biomass on the fourth day of of its life where as the larval biomass on the same day varied from 1.18 to 2.92 mg. The biomass in the larvae decreased with increase in the concentration of the biobit . Corresponding concentrations under both methods of treatment exerted similar influence on the larval biomass on te 4th, 5th and 12th day. So it was found that any concentrations of biobit was found more effective on 8th and 12th day under leaf dip method . Pupae obtained from male and female treated with any of the concentrations of the biobit was considerably lighter than that obtained from the untreated moths ($P < 0.01$). The female live d longer than the male in response to treatment with any concentration of the biobit the life span in both sexes , decreasing with the increasing concentration , differed with concentration of biobit. The treatment with residue film of any concentration of biobit induced significantly less larval survival as compared the untreated parents .

V. CONCLUSIONS

Sesame as common known as til in orai (jalaun) it is and oldest oil crop it is a rich source of protein and carbohydrate due to is nutritional ,medicinal,and cooking qualities it is also known as the queen of oils. To increase the productivity of sesame a large no. of insecticides have been used for the control of the capsule borer , *A.catalaunalis* . *Bacillus thuringienis* Berliner , a spore forming bacteria which is pathogenic to many insect pests is used to control this pest. To increase the productivity of sesame oil the following studies have been planned *A catalaunalis* so as to develop effective and economical management of this pest.

1. Pest complex

2. succession, incidence and population built up of pests
3. Seasonal bionomics of *A.catalaunalis*
4. Population regulatory mechanism
5. Biocontrol

Biobit in combination with chemical insecticides showed increased toxicity of each insecticide it contributed toxicity when mixed with mono crotophos her whereas it was Minimum in combination with cypermethrin. Result showed that the insecticides which belongs to synthetic pyrethroid group were more toxic any other group of insecticide the most toxic compound recorded was cypermethrin it was closely followed by fenelaterate , endosulfan , malathionand monocrotophos.

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