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# Use of crop residues, light traps and oil traps as attractants for the management of sesame pod bug (*Elasmolomus sordidus* Fabricius) on sesame

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**Abstract :** Studies were conducted on the use of crop residues such as weeded out grasses, dried guava leaves, groundnut haulms, sesame plants with capsules, sugarcane bagasse, coconut coir pith and threshed out sorghum ear heads, light traps (40, 100, and 200 Watt incandescent light) and oils of groundnut, sesame, mustard and neem as attractants to sesame pod bug (SPB) both under field and threshing floor condition. Sesame plants with capsule, groundnut haulms, grasses, threshed sorghum ear heads and dried guava leaves were equally effective in attracting the SPB in large numbers when compared to sugarcane begasse, coconut coirpith under both condition. Higher intensities *viz.* 100 and 200 watt were more effective with mean bug catches 27.5 and 44.8 bugs per week respectively and can be utilized for monitoring and management of SPB. Among the vegetable oils tested for attraction of bugs, groundnut and sesame oils were effective than mustard oil. The groundnut and sesame oil traps attracted 9.12 and 9.05 insects per trap respectively while mustard oil attracted only 1.05 insects. Neem oil had no effect.

*Keywords: Sesame, Elasmolomus sordidus, Crop residues, Light traps, Oil traps.*

## Introduction

Sesame pod bug, *Elasmolomus sordidus* was reported as a post- harvest pest of sesame occurring in large numbers on the harvested sesame plants which were heaped for curing in the threshing floor. It was also observed that bugs in all stages of development were feeding on the green pods of sesame in the field (Mohanasundaram *et al.* 1980 ; Mohanasundram and Sundara Babu 1987). This insect is nocturnal in habit and feeds on the capsules only during the night time. During the day time it hides under the fallen plant materials, weeds, cracks and crevices in the field. It migrates from the field to threshing floor along with the harvested plants transported for curing. It damages the seeds leading to poor seed quality, reduction in seed weight and oil content.

Corby (1947) suggested that bagging the groundnut kernels in thickly woven bags, removal of all vegetation near the stores, the use of damp straw as a trap and spraying with contact insecticides were effective. Mohanasundaram and Sundara Babu (1987) observed that the baits of crushed groundnut kernels or powdered groundnut or sesame cake kept in the open sesame field did not attract the bugs. When these baits were kept in manure pit and rubbish dump the bugs were found to be attracted especially to groundnut kernel. In the present study, the use of crop residues, light traps and oil traps were exploited as attractants for the management of *E.sordidus.*

## Materials and Methods

A field experiment was conducted with cop residues *viz.* weeded out grasses, dried guava leaves, groundnut haulms, sesame plants with capsules, sugarcane bagasse, coconut coir pith and threshed sorghum ear heads as attractants for the SPB in the field. Sesame variety TMV 3 was raised in an area of one acre during Rabi 1996 adopting all the package of practices except the plant protection measures. Various crop residues used as attractants were collected and kept in heaps of about one cubic foot at every 2 meter distances in various places of field, especially in the irrigation channels during evening hour on 74, 79, 84 and 89 days after sowing (DAS) at five days interval. The treatments were replicated for three times. The bugs attracted to the crop residues were killed by dusting with carbaryl 10D during the next day morning. The number of dead bugs per heap were recorded in each treatment. Fresh crop residues were used and places of heaping were changed every time of treatments given on 79, 84 and 89 DAS.

The sesame crop was harvested on 90 DAS and heaped in a circular fashion to a height of 6 feet with 2 meter diameter at center of threshing floor (30' x 30') about a week for

Table 1. Efficacy of crop residues as attractants to *E. sordidus*

| Treatment | Mean number of bugs attracted / Day * | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Field | | | | | Threshing floor | | | |
| | 75 DAS | 80 DAS | 85 DAS | 90 DAS | Mean | 7 DAH | 8 DAH | 9 DAH | Mean |
| Grasses | 107.3a | 101.7a | 84.7a | 59.3a | 88.25 | 84.7ab | 50.0ab | 34.0a | 56.23 |
| Dried guava leaves | 98.7a | 105.0a | 89.7a | 64.0a | 88.35 | 89.7ab | 55.0ab | 37.0a | 60.56 |
| Sesame plants | 113.7a | 119.0a | 98.3a | 72.0a | 100.75 | 98.3a | 59.0a | 40.0a | 65.76 |
| Groundnut haulms | 110.0a | 111.3a | 94.7a | 68.7a | 96.18 | 94.7ab | 57.3a | 43.3a | 65.10 |
| Sugarcane bagasse | 63.0b | 60.0b | 48.0bc | 48.3a | 54.82 | 51.7c | 35.7b | 22.3ab | 36.56 |
| Coconut coir pith | 35.3b | 27.0c | 22.0c | 17.3b | 25.40 | 22.0d | 8.3c | 5.0b | 11.76 |
| Sorghum ear head | 102.3a | 100.0a | 76.0ab | 56.0a | 83.58 | 76.0b | 42.7ab | 30.7a | 49.80 |

In a column, means followed by common letter are not significantly different at the 5% level by DMRT
* Mean of three replications
DAS - Days after sowing;DAH - Days after harvest

Table 2. Efficacy of different vegetable oils in the attraction of *E.sordidus*

| S.No | Treatments | Age of the crop (DAS) | Number of insects attracted* | | |
|---|---|---|---|---|---|
| | | | Nymphs | Adults | Mean |
| 1 | Groundnut oil | 75 | 6.4b | 4.8c | 5.60 |
| | | 80 | 8.2ab | 7.8bc | 8.00 |
| | | 85 | 10.6a | 10.2ab | 10.40 |
| | | 90 | 12.2a | 12.8a | 12.50 |
| 2 | Seasame oil | 75 | 4.0c | 7.0b | 5.50 |
| | | 80 | 7.8b | 8.0b | 7.90 |
| | | 85 | 12.0a | 8.4ab | 10.20 |
| | | 90 | 13.0a | 12.2a | 12.60 |
| 3 | Mustrad oil | 75 | 0.4a | 0.4a | 0.40 |
| | | 80 | 0.8a | 0.4a | 0.60 |
| | | 85 | 0.8a | 0.4a | 0.60 |
| | | 85 | 0.8a | 0.6a | 0.70 |
| | | 90 | 3.2a | 1.8a | 2.50 |
| | | Mean | 1.3 | 0.8 | 1.05 |
| 4 | Neem oil | 75 | 0.0a | 0.0a | 0.00 |
| | | 80 | 0.0a | 0.0a | 0.00 |
| | | 85 | 0.0a | 0.0a | 0.00 |
| | | 85 | 0.0a | 0.0a | 0.00 |
| | | 90 | 0.2a | 0.0a | 0.10 |
| | | Mean | 0.05 | 0.0 | 0.02 |

In a column, means followed by a common letter are not significantly different at the 5 % level by DMRT
* Mean of five replication

curing. Before opening the heap for threshing on 7 days after harvest (DAH) the crop residues *viz.* weeded out grasses, dried guava leaves, groundnut haulms, sesame plants with capsules, sugarcane bagasse, coconut coir pith and threshed sorghum ear heads were kept in heaps of about one cubic foot at every 2 meter distances at the periphery of threshing floor. They were replicated for three times. Then the heaped sesame plants were spread and observed for the bug attraction to crop residues. The bugs attracted to each treatment were killed using carbaryl 10D and the dead insects were recorded on 7, 8 and 9 DAH. The crop residues and places of heaping were changed every time of treatments.

Light traps with 40, 100 and 200 W incandescent bulbs as light source were set up in the field at three different locations to study the response of the SPB to them. The light traps were operated daily between 6 to 11 p.m. The bugs arrtacted to each light trap were collected and counted separately for one year from August' 96 to July' 97. The mean number of bugs trapped in a year in the three different intensities of light were compared.

Since the sesame pod bug sucks the oil from the seeds of the natural host, a preliminary study was conducted with oils of sesame, groundnut, mustard and neem to find out their attractiveness to SPB under field condition during the peak occurrence of the pest on 75, 80, 85 and 90 DAS. Twenty five ml in each of sesame, groundnut, mustard and neem oils were kept in plastic bowls (15 cm diameter) in the field at various places during night hours. The neem oil was used as a check to confirm its repellent nature. Five replications were maintained. The next day, the plastic bowls containing oil were observed and the number of bugs attracted to each treatment was recorded.

## Results and Discussion

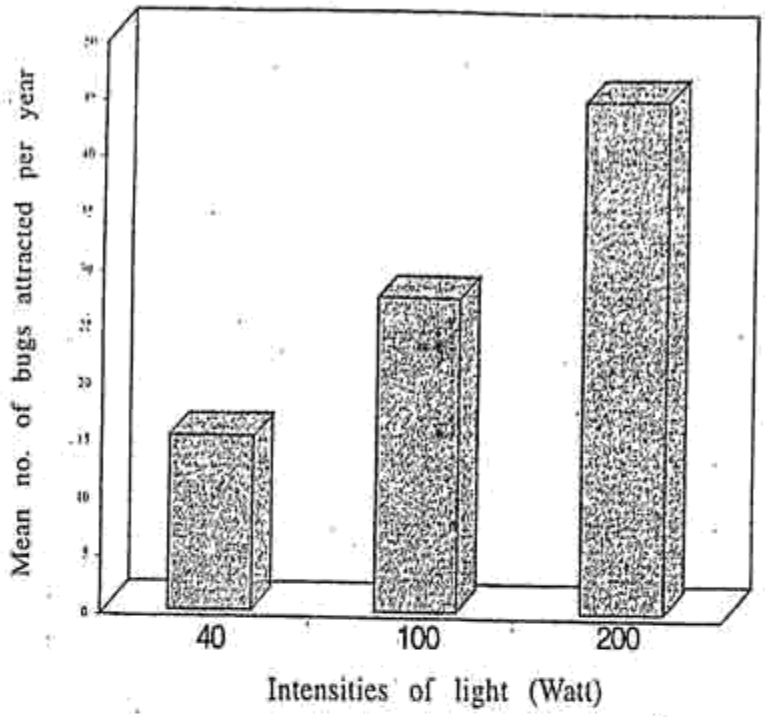
In the field, the efficacy of various crop residues as attractants to pod bug in the descending order was sesame plants with capsules, groundnut haulms, grasses, threshed sorghum ear head, dried guava leaves, sugarcane bagasse and coconut coir pith which attracted mean number of bugs 113.7, 110.0, 102.3, 107.3, 98.7, 63.0 and 35.3 respectively on 75 DAS. On 80 DAS, the mean bugs attracted were 119.0, 111.3, 105.0,101.7, 100.0, 60.0 and 27.0 in the sesame plants, groundnut haulms, grasses, threshed sorghum ear head, dried guava leaves, sugarcane bagasse and coconut coir pith. On 85 and 90 DAS, the same trend was observed in attraction of bugs (Table 1).

In the threshing floor, when these crop residues were used as attractants for the bugs harbouring in the sesame plants kept in heaps for curing, the mean number of bugs attracted on 7DAH were 98.3, 94.7, 89.7, 84.7, 76.0, 51.7 and 22.0 in sesame plants, groundnut haulms, dried guava, leaves, grasses, threshed sorghum ear heads, sugarcane bagasse and coconut coir pith, respectively. On 8 DAH the same trend was observed in all the crop residues. On 9 DAH, groundnut haulms attracted more number of bugs (43.3) than coconut coir pith (5.0 bugs).

The results indicated that sesame plants with capsules, groundnut haulms, grasses, threshed sorghum ear head and dried guava leaves were equally effective in attracting the bugs in large numbers compared to the coconut coir pith and sugarcane bagasse. In the threshing floor also, the same trend was observed. Coconut coir pith attracted only a very few bugs. Corby (1947) reported that removal of all vegetation near the groundnut stores, the use of damp straw, as a trap and spraying with contact insecticides were the only methods of control in Nigeria. The present investigation indicated that the available crop residues like sesame plants with capsules, groundnut haulms, grasses, etc. could be effectively used as traps both in the field and threshing floor to control the bugs as a low cost or no cost technology.

The study on the efficacy of three different intensities of incandescent light *viz.* 40, 100 and 200 W in the attraction of pod bug showed that 200 W incandescent light was superior to other two, with mean catches of 15.2, 27.5, 44.8 bugs per year, respectively. The mean catches per week were always more in the case of 200 W followed by 100 W and 40 W (Fig.1). It clearly indicated that highest catches were made consistently with 200 W incandescent light throughout the year. Information on the use of light traps for the control of this bug on sesame is not available. Mercury vapour lamp (125 W) attracting more rice black bug than incandescent lamp (40 W) was reported earlier (Saroja *et al.* 1993). Ramasubramanian (1996) also reported that

Fig.1. Attraction of *E. sordidus* to different light intensities




125 W incandescent light attracted more rice black bug than 40 W. The present findings are in confirmity with the findings of the above workers. Therefore, the higher intensities of 100 and 200 W incandescent lights can be effectively employed for monitoring and management of SPB.

Studies were also made to evaluate the efficacy of groundnut oil, sesame oil, mustard oil and neem oil in the attraction of SPB under field condition. Of these, groundnut and sesame oils were found very effective in attracting the bugs followed by mustard oil. Neem oil was not effective in attracting the bugs but acted as a repellent (Table 2). Mohanasundaram and Sundara Babu (1987) reported that the baits of crushed groundnut kernel, groundnut cake powder and sesame cake powder did not attract any bugs in the field, but groundnut kernal was effective possibly, baits of groundnut and sesame cakes, bereft of oil, would not have been preferred by the insects. The present study revealed that oil trap with groundnut oil and sesame oil, can be used to reduce the bug population to some extent.

The sesame plants with capsules, groundnut haulms and grasses could be effectively utilised as attractants from 75 DAS to harvest in the field and 7 DAH in threshing floor. The higher intensities of 100 and 200 W incandescent lights and oil traps of groundnut and sesame oil could be employed at the peak occurrence of the pest from 75 DAS to harvest for monitoring and management of sesame pod bug.

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