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Original Research Article

The Role of IPM Approaches against Sesame Web-Worm (*Antigastra catalaunalis*) on Sesame Varieties Production in Benadir Region, Somalia

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Abstract: The sesame web worm (*Antigastra catalaunalis*) is the most important and serious pest attacking sesame in its early stages. It feeds on tender foliage by webbing the top leaves and bores into the capsules thus feeds in the internal contents. The objective of this study was to study the' Susceptibility of Sesame varieties and performance of plant extracts (neem powder, garlic powder, and insecticide Escort 19EC against sesame webworm (*Antigastra catalaunalis*) (lepdidoptera: pyralidae) on sesame production. The field experiment was established at the Gaheyr experimental field of Faculty of Agriculture and Environmental Science, Somali National University, Mogadishu, Somalia. The trial was laid out in a Randomized Complete Block Design (RCBD), featuring three replications with eight distinct treatments. This study evaluated the susceptibility of two sesame varieties—the local Somali 'Dunyar' and the Ethiopian 'Humera'—to webworm infestation. The trial included both treated and untreated (control) groups for each variety. To quantify infestation, five plants were randomly selected from each plot, and the percentage of infested plants was recorded. The result of this study indicates that the Treated varieties with Escort 19EC And Neem was less infested and the reduction of pest infestation was observed. The infestation percentage of all treatments before spray was recoded a similar percentage i.e. (100%) of infestation. However, the measured infestation after first spray relatively reduced into 30% at the treatment of Humera treated with Escort 19EC, and 40% for the treatment of local white treated with same insecticides thus insecticide Escort 19EC showed a great significant of the reduction of the Sesame webworm infestation. The study also briefly indicates that other treatments, neem powder, and garlic done slighter reduction on the infestation of the sesame webworm (*Antigastra catalaunalis*).

Keywords: Sesame Webworms, Economic Damage, Pest Incidence, Integrated Pest Management.

1. INTRODUCTION

Sesame (*Sesamum indicum L.*) is a member of the Pedaliaceae family and it is a historic traditional crop (Fuller, 2003) that is mostly farmed for oil in south Asian countries and African countries (Umar *et al*., 2010), and is referred to as the "queen of oilseeds" (Tunde-akintunde *et al*., 2004). Sesame is a valuable cover crop that is planted for food (dry seeds), feed (seed, leaves, and young branches), and other elements of the plant, such as flowers, are also effective in cancer treatment (Ratnasingam *et al*., 2021). Origin and distribution of sesame comes from Africa and spread early through West Asia, China and Japan, which themselves became secondary centers of diversity. The wild Sesamum species are found in Africa (Ratnasingam *et al*., 2021). The global sesame crop is cultivated over More than 9.42 million hectares of the total world crop area is under sesame cultivation with about 4 million metric tons of total production, which results in an average productivity of 382 kg per hectare (Humera, 2016)

In Africa, Sesame is a crop of tropics and in some temperate areas. It grows best on the areas which have an altitude of 500 to 800 meter above sea level. It needs a growing period of 70 to 150 days. The optimum

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pH for growth ranges from 5.4 to 6.7 and good drainage is crucial.

It is intolerant of very acidic or saline soils. The optimum temperature for growth varies with cultivar in the range 27°C to 35°C. Periods of high temperature above 40°C during flowering reduce capsule and seed development. It requires from 600 to 1000 mm amount of water (Evaluation of Yield and Yield Components of Sesame (*Sesamum Indicum* L.) Varieties under Irrigation in Lowland Area of South Omo Zone, Southern, 2022). In Somalia, sesame, locally called (Sisin) and is widely used and really popular in parts of the South, where it's commonly grown. It's one among the most cash crops cultivated in Somalia. It's processed into oil. It contains about 50-60% of oil. It's marketable and exported hugely to Dubai and Other countries within the word. The crop is very drought tolerant, grows well in most soils, regions and is compatible to different crop rotations. Actually, sesame is usually grown by small holders in low rainfall areas and with low management inputs (Islam & Sidkar, 2020).

The insect pests such as sesame webworm (*Antigastra catalaunalis*), sesame seed bug (Elasmolomus sordidus), Pod borer (*Helicoverpa armigera*), Gall midge (*Asphondylia sesami*) are the most important insects that affect the production of sesame. Notably, the sesame webworm (*Antigastra catalaunalis*) is considered a pre-harvest insect pest which affects the sesame during various growth stages starting from 2 to 3 weeks after emergence up to harvesting (Gebregergis *et al*., 2018). Due to the significant losses in crop production it causes each year, the leaf webber (*Antigastra catalaunalis*) is considered a serious insect pest of sesame. It feeds on practically every stage of the crop and assaults it during the growth season (Thakur and Ghorpade, 2006). The pest also causes 83% yield loss. It feeds on delicate leaves by webbing the upper leaves and burrowing into the pods and shoots. It also causes 10-70% leaves, 34-62% flowers and 10-44% pods infestation resulting in 72% yield loss (Dup, 2023). Production of sesame is essential to Somalia's economy since it is a major cash crop and a major source of revenue for smallholder farmers.

Insect infestations, including those of the sesame webworm (*Antigastra catalaunalis*), pose biotic difficulties to sesame and can significantly reduction to the crop production. Due to ineffective pest control methods that result in decreased productivity and financial losses, as well as 4 reliance on insecticides alone, which is insufficient to control sesame webworms (*Antigastra catalaunalis*), and because of the negative effects of insecticides on the environment and their devastation of beneficial organisms and natural enemies, and the emergence of insect-resistant to pesticides, as well as the promising plant extracts as environmentally friendly and less residual and alternative pesticides.

Research Objectives:

1. To evaluate and compare the efficacy of botanical powders (neem and garlic) and the synthetic insecticide Escort 19EC against the sesame webworm, *Antigastra catalaunalis*.
2. To quantify the percentage of sesame plant infestation attributable to *Antigastra catalaunalis* under different treatment regimes.
3. To determine the resultant yield loss in sesame caused by varying levels of *Antigastra catalaunalis* infestation.

2. MATERIAL AND METHODS

2.1. Selected Seeds

Seeds of the local sesame variety 'Dunyar' were procured from local farmers in the Afgoye District of Lower Shabelle, Somalia. Seeds of the improved 'Humera' variety were sourced from commercial markets in the Gondar Region of Ethiopia. The viability of all seed lots was confirmed through standard germination tests prior to the experiment.

2.2. Preparation of Selected Insecticides

Botanical ingredients were prepared from locally sourced, mature neem (*Azadirachta indica*) seed kernels and garlic (*Allium sativum*) bulbs. The neem fruits were shade-dried, while the garlic bulbs were air-dried and threshed. Following complete desiccation, both materials were ground separately into a fine powder using a mechanical grinder. Aqueous extracts were subsequently prepared by suspending the powdered materials in water at a concentration of 50 grams per liter (50 g/L). For comparison, the synthetic insecticide Escort 19EC was procured from Greenlife Crop Protection Africa Co. (Nairobi, Kenya). This chemical treatment was prepared as an emulsion in water, adhering to the manufacturer's recommended application rate of 0.5 milliliters per liter (0.5 ml/L).

2.3. Irrigation Method

Furrow irrigation was utilized to sustain uniform soil moisture levels across the experimental plots, hence guaranteeing ideal growth conditions for the sesame plants.

2.4. Land Preparation

The experimental site was prepared by manual tilling using hand hoes and subsequently levelled. The layout followed a Randomized Complete Block Design (RCBD) with three replications. The total area was subdivided into 24 experimental plots, each measuring 3 m × 2 m (6 m²). A buffer distance of 0.3 m was maintained between individual plots, and a wider alley of 0.5 m separated the blocks. Consequently, the total land area utilized for the experiment was 220.66 m² (11.8 m × 18.7 m).

2.5. Experimental Design

The experiment was laid out in randomized complete block design (RCBD) with three replications for each treatment.

2.6. Cultural Practices

Seeds were sown in seedbeds with a depth of 3cm. The seeds of each variety were sown at row to row and plant to plant in six alternate rows with 5 seedbeds per row, maintaining three seeds per seedbed which giving a total of 120 plants per plot with a spacing of 30 × 15 cm, respectively, and a plot size of 2 × 3 m for each treatment Thinning of seedlings was conducted two weeks after germination, A furrow irrigation system was installed for crop irrigation, supplemented by autumn rain to meet the crop's water requirements. Fertilizer applications and hand weeding were practiced when necessary.

2.7. Application of selected insecticides

The application of botanical extracts Garlic powder, Neem powder and synthetic insecticide of Escort 19EC on sesame webworm were carried out in late afternoon at calm period using a high-volume rates of knapsack 16L sprayer by applying an amount of 0.5ml of Escort 19EC /L of water. Moreover, 50gram of Garlic and Neem /L of water with amendments of soap and Arabic gum were added. Four sprays were conducted during the pest prevalence. The untreated plots were left un sprayed to evaluate the maintenance of Sesame webworm.

2.8. Sampling and Data Collection

This had been attained through regular periodical surveys early in the morning. Five plants per plot were taken randomly from the inner rows for assessing Sesame Webworm infestation for the various treatments. Each leaf was thoroughly examined visibly. Application of insecticides was done when Sesame Webworm infestation reached at the peak. Efficacy of the tested treatments against Sesame Webworm was done at pre and post spray counts at regular intervals of 24hrs, 48hrs, 72hrs, 4days and 7days after spraying. Infestation percentage the infestation percentage of sesame webworm was calculated using the following formula:

$$\text{Sesame infestation by webworm\%} = \frac{number\ of\ infested\ plants\ per\ plot}{total\ number\ of\ plants\ per\ plot} \times 100$$

2.9. Assessment of Sesame Yield

To minimize edge effects and ensure data accuracy, a one-meter border was established on all sides of each plot. Harvesting was confined to the central area of the plot, and the total biomass yield (kg) from these plants was recorded for each treatment.

Data Analysis

The Data was analyzed using statistic 8 programs. Then Duncan multiplied range test (DMRT) was used for treatment means comparison.

3. RESULTS AND DISCUSSION

Monitoring of sesame webworm (*Antigastra catalaunalis*) infestation commenced upon the initial observation of symptomatic damage on sesame leaves. The pest population increased rapidly, reaching the economic threshold level within the first week prior to treatment application, as detailed in figure 1. Pre-treatment data from this initial assessment confirmed no significant differences in mean infestation levels among the various treatment groups. These groups included the Humera and local white varieties treated with synthetic insecticide, neem, or garlic extracts, alongside their respective untreated controls. The mean infestation levels across all treatments ranged from 60.000 to 86.667, with all values assigned to the same statistical grouping (denoted by 'A'). At this initial stage, no intervention was applied. However, 24hours after the first spray, a relative reduction in infestation was recorded across all treatments. The (Humera insecticide, Humera Neem, Humera garlic, local white insecticide, local white neem, local white garlic) treatments recorded extremely low infestation at a mean of (30.000C, 33.333c, 30.000c, 40.00c, 46.667bc, 35.000c) compared to the untreated plots (Humera untreated, local white untreated) with a mean of (93.333a,70.000bc) showing a significant increase in infestation. By the second post-treatment assessment (48 hours after the spray), infestation levels continued to decline, showing a noticeable decrease compared to untreated control of Humera untreated and local white untreated (83.333a, 80.000a). However, there was no significant difference among botanical treatments, as garlic, neem, and the insecticide continued to suppress webworm infestation effectively. After 72 hours, the reduction in infestation was more pronounced in all treated plots. The infestation remained lower, while untreated control plots retained a high infestation. level of (86.667a, 80.000a). By the fourth day, infestation levels further declined in treated plots, with Humera insecticide and neem treatments shows the lowest infestation rate of(25.000B.) By the seventh day, the infestation levels among treatments stays lower but with a little bit increase, this occurs because sufficient time has passed allowing the pests to recover. The Humera insecticide, Humera garlic treatment sustained the lowest infestation (50.00b, 43.000b), followed by neem (53.333b), whereas the untreated control plots showed the highest infestation level of (93.333a, 93.000a).

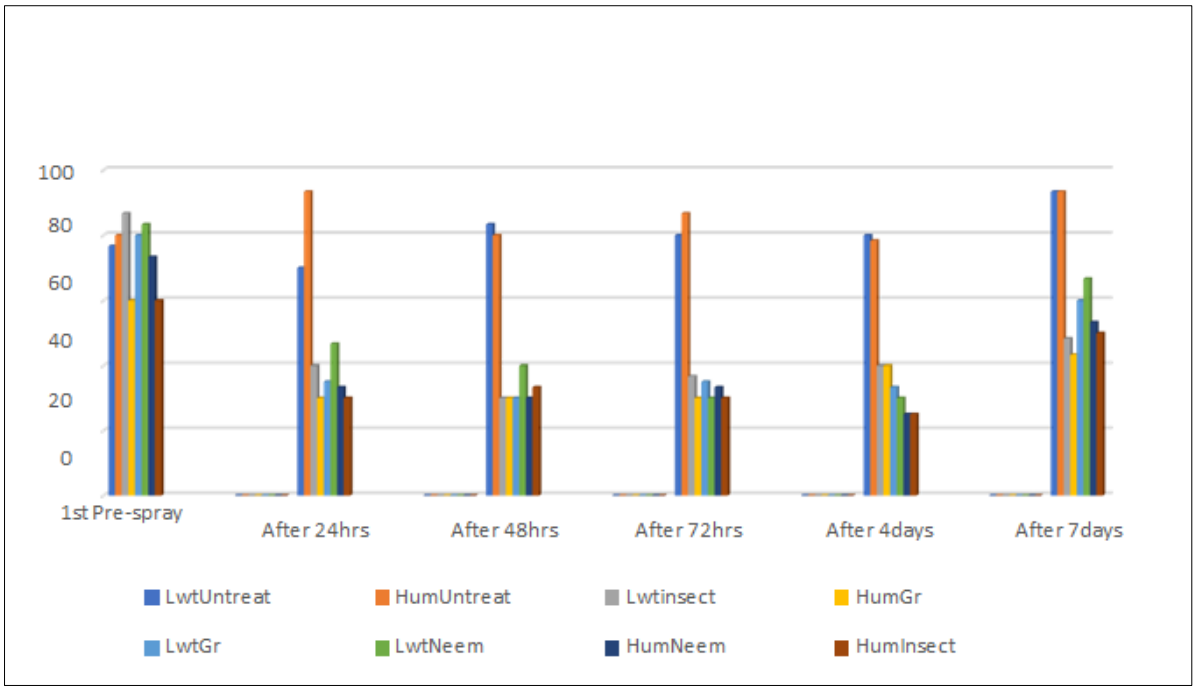

Figure 1: The mean number of infestation percentage on Sesame webworm of 1st spray count

The significant reduction in infestation following applications of Humera insecticide, neem, and garlic treatments aligns with findings from previous studies. For instance, (Ahirwar *et al*., 2010) reported that natural products like neem oil and neem seed kernel extract effectively reduced sesame webworm populations. Similarly, (Karuppaiah., 2014) demonstrated that eco-friendly management practices, including the use of neem-based formulations, significantly suppressed *A. catalaunalis* infestations. These studies corroborate the efficacy of botanical extracts in managing sesame webworm infestations, supporting the results observed in the current assessment.

3.1 The 2nd spray Assessment of Sesame Webworm (*Antigastra catalaunalis*) Infestation on Sesame Under Field Experiment Treated by insecticide Escort 19EC Some Botanical Extracts (Neem powder and Garlic)

The assessment of Sesame Webworm (*Antigastra catalaunalis*) infestation level was conducted immediately the next week after the first spray of the first week, with a gap of 2-3 days, when the infestation symptoms of sesame webworm on sesame increased.

The pre-spray data of the second spray showed no significant difference between treatments except Local white Neem, which demonstrates low infestation with a mean of(60.000b), but there was no significant difference in infestation levels between other treatments (Humera insecticide, Humera neem, Humera garlic, local white insecticide, local white garlic and untreated controls) with mean number of (71.667ab, 85.000a, 76.667ab, 80.000ab, 83.333a, 85.000a, 90.000a), respectively. Following the first post-spray, 24hours after assessment, all treatments exhibited a noticeable reduction in infestation levels. Humera insecticide, Humera neem, Humera garlic, local white insecticide, local white neem, local white garlic, showed a significant decline in infestation with a mean of (50.000bc, 70.000ab, 50.000bc, 40.000c, 40.000c, 50.000bc) compared to the untreated Humera and Untreated local white (80.000a, 81.667a).

After the second and third post-spray, further reductions in infestation levels were observed. The treatments of Humera insecticide, Humera garlic, local white insecticide, and local white neem recorded significant reductions, with Humera insecticide dropping to 41.667b at 48 hours and 50.000c at 72 hours. The local white insecticide also significantly reduced the infestation (40.000b at 48 hours, 45.000c at 72 hours). At four- and seven-days post-spray, the infestation levels continued to decline, with (Humera insecticide, Humera neem, Humera garlic, local white insecticide, local white neem, and local white garlic) consistently demonstrating lower infestation percentages compared to untreated controls.

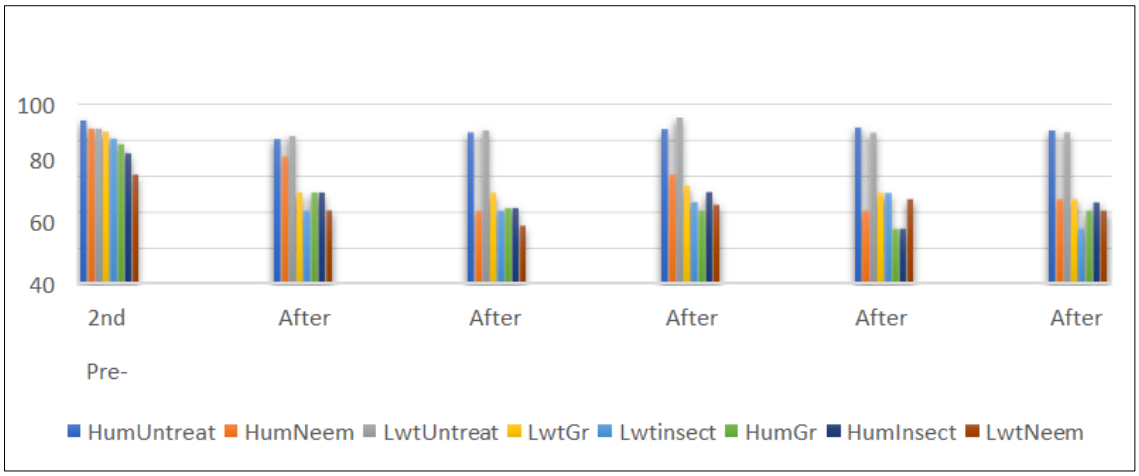

Figure 2: The mean number of infestation percentage on Sesame webworm of 2nd spray Count

The significant reduction in infestation following applications of Humera insecticide, neem, and garlic treatments aligns with findings from previous studies. For instance, (Ahirwar *et al*., 2010) reported that natural products like neem oil and neem seed kernel extract effectively reduced sesame webworm populations. Similarly, (Karuppaiah 2014) demonstrated that eco-friendly management practices, including the use of neembased formulations, significantly suppressed (A. catalaunalis) infestations. These studies corroborate the efficacy of botanical extracts in managing sesame webworm infestations, supporting the results observed in the current assessment.

3.2 The 3rd spray Assessment of Sesame Webworm (*Antigastra catalaunalis*) Infestation on Sesame under Field Experiment treated by insecticide Escort 19EC Some Botanical Extracts (Neem powder and Garlic)

Infestation levels of sesame webworm (*Antigastra catalaunalis*) were evaluated one week after the second spray application (i.e., in the third week of the trial), as this period typically exhibits a pronounced increase in symptom expression. Before treatment application, there was no significant difference in infestation levels between the treatments. The pre-spray infestation percentages were recorded as (Humera insecticide, Humera neem, Humera garlic, Humera untreated, local white insecticide, local white neem, local white neem, local white garlic and local white untreated), with a mean of 85.000a 85.000a 80.000a, 80.000a, 76.667 and 86.667 respectively. These results indicate that all treatments started with high infestation levels before any interventions were implemented. After the first post-spray (24 hours), all treatments showed a significant reduction in infestation levels compared to the untreated controls. Humera insecticide drop to 46.667c, while Humera neem (43.333c) and Humera garlic (40.000c) also showed reductions. The untreated control, however, maintained high infestation levels at 81.667ab, indicating that the sprays were beginning to show efficacy. By 48 hours post-spray, infestation levels in treated plots continued to decline. The Humera insecticide, Humera neem and Humera garlic with a mean of (46.667bc, 31.667c, 43.333bc), showed a further decrease, whereas the untreated control remained significantly higher at 86.667a. The local white insecticide, neem, garlic) exhibited reductions with a mean of 60.000b and 48.333bc, 53.333bc respectively. At 72 hours post-spray, the treatments further reduced the infestation levels. The Humera (insecticide, neem, garlic) recorded with a mean of (53.333b, 33.333b, 55.000b) remained lower than untreated Humera control (90.000a). The local white (insecticide, neem, garlic) treatments also provided moderate control, recording (60.000b 46.667b, and 46.667b) respectively. By 4 days post-spray, the infestation levels continued to decrease across all treatments. Humera (insecticide, neem and garlic) with a mean of (46.667c, 43.333c, 38.333c) maintained significantly lower infestation levels compared to the untreated Humera control (86.667a). The local white (insecticide, neem and garlic) treatments exhibited moderate reductions, with (43.333c, 56.667bc, 40.000c), respectively. While the untreated local white remained (83.333ab). At 7 days post-spray, the Humera insecticide treatment remained the most effective, with an infestation reduction to 46.667d, followed by Humera neem and Humera garlic (53.333cd, 68.333bc). The untreated control, however, maintained high infestation levels at (80.000ab). The local white (insecticide, neem and garlic also provided moderate reductions with a mean of (70.000bc, 65.000bcd and 63.333bcd). Across all observation periods, all treatments provide the highest level of infestation reduction of sesame webworm but with no touchable difference between them. The results indicate that integrated pest management (IPM) approaches using insecticides and botanical extracts can effectively reduce Sesame Webworm infestations on sesame crops.

The combination of chemical insecticides (Escort 19EC) with botanical extracts (neem and garlic) provided a sustainable control approach.

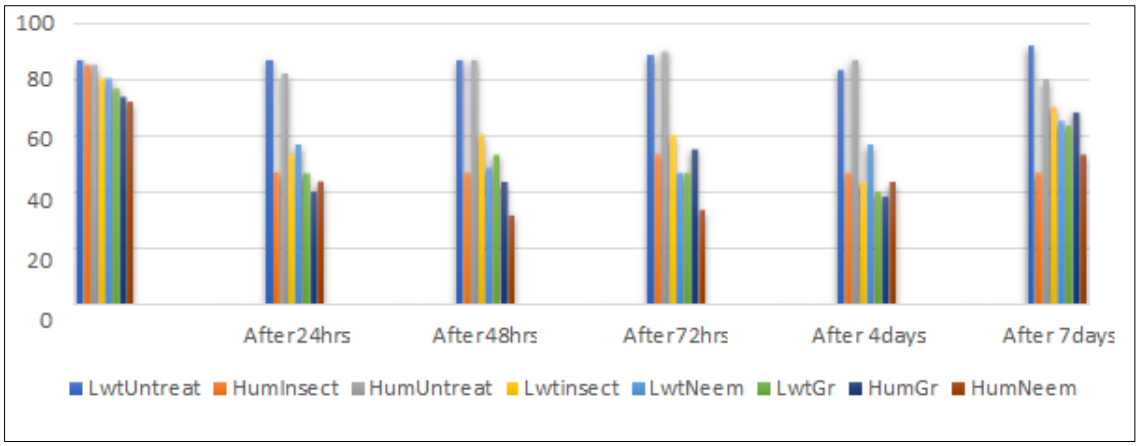

Figure 3: The mean number of infestation percentage on Sesame webworm of 3th spray

The significant reduction in sesame webworm infestation following the application of Humera insecticide, neem, and garlic extracts is consistent with established research. For instance, Ahirwar *et al*., (2010) documented the efficacy of natural products like neem oil and neem seed kernel extract in reducing webworm populations. Corroborating this, Karuppaiah (2014) found that eco-friendly practices, including neem-based formulations, significantly suppressed infestations by *A. catalaunalis*. Collectively, these earlier findings validate the use of botanical extracts for managing this pest and strongly support the results of the present study.

3.3 The 4TH spray Assessment of Sesame Webworm (Antigastra catalaunalis) Infestation on Sesame under Field Experiment treated by insecticide Escort 19EC Some Botanical Extracts (Neem powder and Garlic)

The assessment of Sesame Webworm (*Antigastra catalaunalis*) infestation level was conducted the fourth week after the third spray of the third week, with a gap of 2-3 days, when the infestation symptoms of sesame webworm on sesame elevated once again. The pre-spray treatment infestation levels showed no significant differences among treatments, with (Humera insecticide, neem, garlic, and untreated) sesame plants recording high infestation rates at mean numbers of (83.333a, 80.000a, 90.000a, and 90.000a,) respectively. Similarly, (Local White insecticide, neem, garlic, and untreated Similarly, (Local White insecticide, neem, garlic, and untreated control) also exhibited high infestation levels at (71.667a, 80.000a, 80.000a, 85.000a, respectively), confirming that no control measures had yet been applied. Upon conducting the first treatment application (24 hours post-spray), there was a notable reduction in infestation levels across all treatments except for untreated controls. The Humera (insecticide, neem, garlic,) demonstrated effective reduction of (46.667b, 46.667b, 60.000b). While the local white (insecticide, neem, garlic) registering infestations of (46.667b, 46.667b, 36.667b), respectively. The untreated control, however, remained high at (88.333a and 90.000a), reflecting no decrease in infestation levels. At 48 hours post-treatment, the infestation levels showed a further decline, with Humera insecticide recording a significant drop (33.333c), followed by Humera (neem and garlic) (46.667bc, 53.333bc). While Local White (insecticide neem and garlic) (45.000bc, 50.000bc 41.667bc) also exhibited reduced infestation, Meanwhile, the untreated controls remained significantly infested (88.333a and 63.333ab) control) also exhibited high infestation levels at (71.667a, 80.000a, 80.000a, 85.000a, respectively), confirming that no control measures had yet been applied.

By 72 hours post-spray, the effectiveness of treatments became more apparent, with Humera (insecticide, neem, garlic and Local White insecticide, neem, garlic) recorded lower infestation rates at (33.333c, 40.000c, and 53.333c, respectively). Local White neem and Local White garlic followed a similar pattern, with infestation rates of (40.000c and 60.000bc), demonstrating a consistent reduction in pest populations. However, untreated controls (88.333a and 86.667ab) still displayed persistent infestation, further emphasizing the efficacy of the applied treatments. Observations at 4 days post-treatment revealed varying effectiveness, with Humera insecticide, Humera garlic, and Local White insecticide maintaining reduced infestation levels at (60.000b, 60.000b, and 38.333c), respectively. While Local White (insecticide neem and garlic) demonstrated comparable reductions (38.333c, 38.333c 50.000bc). However, the untreated control treatments (88.333a and 98.333a) continued to exhibit the highest infestation levels, reinforcing the necessity of intervention.

At 7 days post-treatment, the infestation levels remained lower in treated plots compared to the untreated control. Humera (insecticide, neem, garlic) recorded an infestation rate of (71.667bc,63,33c, 76.667abc) indicating its continued effectiveness. Local white (insecticide, neem and garlic) (60.000c 63.333c, 66.667) respectively, showed sustained control. The untreated control, however, maintained the highest infestation at (90.000ab and 91.667a), signifying a lack of natural suppression. Overall, the results indicate that all treatments (Escort 19EC, Neem and Garlic) provided similar performance in reducing *Antigastra catalaunalis*

infestation levels, while untreated sesame varieties experienced persistent and significantly high infestation levels. This highlights the potential of integrating chemical and botanical insecticides within an IPM framework to manage sesame webworm infestations effectively.

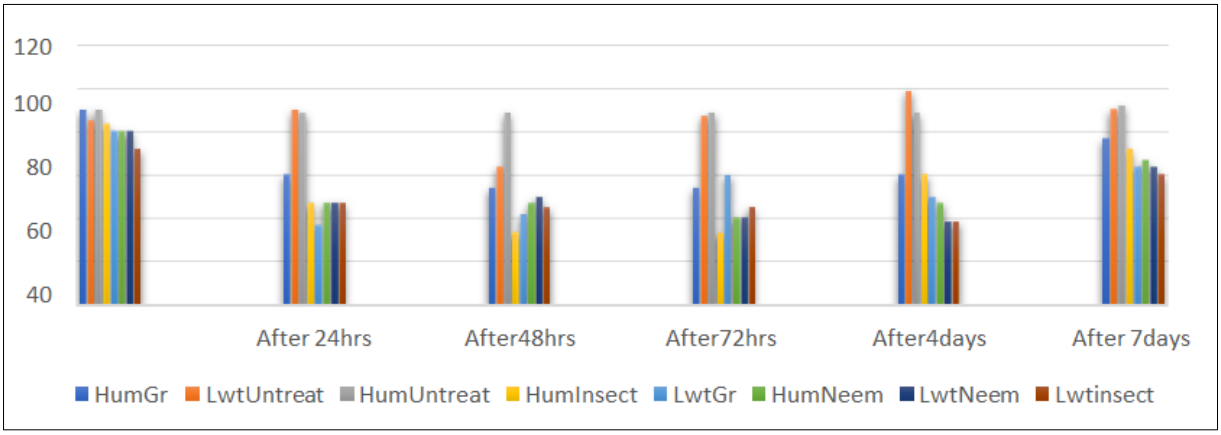

Figure 4: The mean number of infestations percentage on Sesame webworm of 4th spray

The significant reduction in infestation following applications of Humera insecticide, neem, and garlic treatments aligns with findings from previous studies. For instance, a study by (Ahirwar *et al*., 2010) demonstrated that natural products like neem oil and neem seed kernel extract effectively reduced sesame webworm populations. Similarly, research by (Karuppaiah 2014) highlighted that eco-friendly management practices, including the use of neem-based formulations, significantly suppressed *Antigastra catalaunalis* infestations. These studies corroborate the efficacy of botanical extracts in managing sesame webworm infestations, supporting the results observed in the current assessment.

3.4 Assessment of Sampled Sesame Yield Kg per treatment

The evaluation of sesame yield was conducted to determine the impact of different treatments on crop productivity under *Antigastra catalaunalis* infestations. The results indicated significant variations in yield across the applied treatments, The Humera insecticide treatment recorded the highest mean yield (436.17a), followed by Local White Garlic (262.00b) and Local White Insecticide (174.00bc), Moderate yield retention was observed in Local White Neem (139.17bcd) and Humera Neem (83.00cd), The Local White Untreated (61.17cd) treatment showed lower yield values, indicating that untreated sesame crops suffered significantly from webworm infestations.

Table 1: Assessment of Sampled Sesame Yield Kg per treatment

Treatment	Treatment Mean	Probability
HumInsect	436.17 A	
LwtGr	85.33 BC	
Lwtinsect	132.83 B	
LwtNeem	116.83 B	
HumNeem	83.00 BC	
LwtUntreat	61.17 BC	
HumGr	63.83 BC	
HumUntreat	22.67 C	0.0000
CV %	38.96	
G.M	125.23	
S.E±	28.168	

4. CONCLUSION REMARKS

In conclusion, all insecticidal treatments significantly enhanced the growth and yield of sesame under webworm pressure, with the synthetic insecticide Escort 19EC yielding the most pronounced effects. The Humera variety treated with Escort 19EC achieved optimal agronomic performance, characterized by maximal leaf area, plant height, flowering, and ultimate productivity. A significant growth response was also confirmed in the treated local white variety. Concerning direct pest management, the treatments demonstrated a distinct efficacy gradient against *Antigastra catalaunalis*. Escort 19EC provided the highest level of control, followed by neem powder, which exhibited statistically greater insecticidal properties than garlic extract.

Research Recommendations

1. It is recommended to adopt and promote Integrated Pest Management (IPM) strategies for the sustainable control of the sesame webworm (*Antigastra catalaunalis*)
2. As there is currently no officially recommended insecticide for sesame webworm, the synthetic insecticide Escort 19EC can be proposed as an effective chemical intervention based on the efficacy demonstrated in this study.
3. For local farmers, the application of Escort 19EC on the Humera variety is recommended, as this combination yielded the most favorable results in terms of both plant growth and webworm suppression.
4. The use of ethanol-extracted Plant-Incorporated Protectants (PIPs) shows promise and warrants further research as a potential foundation for sustainable and eco-friendly pest management strategies.
5. Further researches is required to identify and evaluate more selective and economically viable insecticides to optimize effective and sustainable control measures for the sesame webworm in Somalia.

Conflict of Interest

The authors have no financial or personal conflicts of interest to disclose regarding the publication of this research paper.

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