Assiut Journal of Agricultural Sciences 55 (2) 2024 (170-179)
ISSN: 1110-0486 / EISSN: 2356-9840
Website: http://ajas.journals.ekb.eg/
E-mail: ajas@aun.edu.eg

(Original Article)

Response of Certain Sesame Cultivars to the Infestation of *Antigastra catalaunalis* (Duponchel) (Lepidoptera: Crambidae) Under Field Condition and Two Irrigation Systems

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DOI: 10.21608/AJAS.2024.275986.1346

Abstract

Sesame (*Sesamum indicum* L.) is an important oil crop, which is mainly grown to obtain its seeds that are used for nutritional, medicinal, and industrial purposes. The objective of this study was to evaluate the population fluctuation of the *Antigastra catalaunalis* (Lepidoptera: Crambidae) in flood and drip irrigation systems in sesame cultivars. The experiment was carried out in the farm of the New Valley Research Institute, El-Kharga City, New Valley, Egypt during two successive years, 2021 and 2022. The cultivated sesame varieties were Sohag 1, Shandaweel 3, Toshka 1 and Giza 32. The obtained results showed that the *A. catalaunalis* infestation started in the second week of August by 25.00 and 17.67 larvae/100 pods in the cultivars Sohag1 and Shandawil3 while in cultivars Toshka1 and Giza32 the infestation started in the first week of August by 15.33 and 5.00, larvae/100 pods respectively. On the other hand, the population increased gradually to reach the highest average number in the third week of September. Sesame cultivars differed significantly in their responses to infestations of *A. catalaunalis*. The highest level of infestation of *A. catalaunalis* was observed on Toshka1 while the lowest level of infestation of *A. catalaunalis* was observed on Giza32. Data also revealed the presence of highly significant differences between the population of *A. catalaunalis* and irrigation systems (flood and drip). The sesame cultivars are tolerant to insect pests and modern irrigation programs can play a role in reducing the damage caused by agricultural pests and reducing the use of pesticides.

Keywords: *New Valley, Sprinkler irrigation, Drip irrigation, Antigastra catalaunalis, Sesamum indicum L*

Introduction

Sesamum indicum L. (Pedaliaceae) plant is one of the economically important oilseed crops grown in Egypt (El Naim *et al.*,2010; Boghdady *et al.*,2012 and Shaban *et al.*, 2012). It's native to tropical and subtropical areas

Received: 13 March 2024/ Accepted: 1 April 2024/ Published online: 25 April 2024

(Biabani and Pakniyat, 2008 and Kavak and Boydak, 2006), which is grown mainly to obtain its seeds that are used in the production of some foodstuffs, as its seeds are rich in oil, protein, minerals, folic acid, calcium and phosphorous and unsaturated fatty acids (Wei *et al*., 2022 ; Xu *et al*., 2017; Shasmitha, 2015; Patel *et al.,* 2014; Mahrous *et al.,* 2015 and Gharby *et al.,* 2017), and the proportion of oil ranges between 55-60 % and protein from 15-25 % (Ali & Jan, 2014 and Couch *et al.,* 2017. The seed husk is also characterized by a high percentage of raw fibers and materials Mineral, calcium and oxalic acid. Sesame is Planted on 7.54 million hectares with a production of 3.34 million tons and the highest yield (1333 kg/ha) is harvested in Egypt (FAO, 2018). Though India and China are the top sesame-producing countries in the world (Desai, 2004), India ranks first in the world with the largest producer of sesame with a cultivated area of1.8 million hectares (24% of the cropped area) and production and productivity of 0.76 million tons and 413 kg/ha, respectively (Ram *et al.,* 2021).

Sesame plants are attacked by some *insect* pests that cause economic damage to the crop and cause yield losses ranging to 90 % loss in yield such as sesame webworm (*Antigastr acatalaunalis)*, leaf hoppers, aphids, thrips, etc (Ahirwar *et al*., 2010; Gebregergis *et al*., 2016 and Geremedhin and Azerefegne, 2020). Capsule borer *Antigastr acatalaunalis* (Duponchel) is considered a dangerous pest that affects the sesame crop, as it attacks all parts of the plant (except for the roots), including the leaves and stems, as well as flowers and fruits. The infection is characterized by the intertwining of the upper leaves of plants with each other with fine threads that spin them and turn inside them to the pupal stage. Then it pierces capsules and feed on the seeds. This insect causes many flowers and small pods to fall off, and the terminal leaves to dry out (Ahirwar*et al.,* 2010 and Wazire and Patel, 2016). Found that, the active season of *Antigastra* is high from August to October Gupta *et al*., 2002. The key restrictions of sesame productivity and production are a rareness of highly productive and locally suitable varieties, capsule shattering and seed loss, uneven maturity, abiotic Factors (e.g., waterlogging, frost, salinity, and drought) and biotic Factors (insect pests, diseases and mites), the use of traditional production technologies. (Woldesenbet *et al*., 2015; Dossa *et al.,* 2017; Anyanga *et al.,* 2017; Tripathy *et al.,* 2019; Yoland Uzun, 2019and Teklu*et al.,* 2021). The damage to the crop could be due to unimproved cultivars, sensitive to insect pests, Pathogens and climatic conditions. Mentioned that temperature and variety impacted seed yield variation by 39 and 69 %, respectively (Nath *et al*., 2003). Saudyand Abd El-Momen, (2009) Recorded that Shandawel-3 was the best cultivar for producing the largest values of capsules, plant height and seed weights/plant and also biological, oil and seed yields/fed, in Egypt.

Insecticides treatment through a drip irrigation system can replace or reduce the number of foliar insecticide sprays and represents an alternative method for integrated pest management (Ghidiu, *et al*., 2012). However, (Assis *et al*., 2012) found that drip irrigated coffee crops have fewer leaf miners than un irrigated ones.

In the present study, we carried out experiments to investigate the effect of Sensitive varieties and irrigation systems (flood and drip) on the population of *A. catalaunalisin* sesame crops in Egypt.

Materials and Methods

The experiment was carried out in the farm of the New Valley Research Institute, Kharga, New Valley, Egypt, during two successive years starting from May 2021 to October 2022. The cultivated sesame varieties: (Sohag 1, Shandaweel 3, Toshka 1 and Giza 32). The experiment aimed to investigate the impact of Sensitive varieties and irrigation systems (flood and drip) on Population fluctuation of the *A. catalaunalis* in sesame at crop El-Kharga city, New Valley.

The fields were sown in May 2021 and irrigated by flood irrigation (van Steenbergen 1997) or drip irrigation in plots each 3 x 3 m, keeping 20 cm a distance between rows and 20cm between plants.in a simple randomized block design with two treatments and three replications. Two irrigation systems were used: flood irrigation and drip irrigation for sesame fields. Recommended agricultural practices were adopted throughout the two experimental seasons. Pesticides were not used in any of the crops. Sampling in the field was carried out every week and started from the first appearance of *A. catalaunalis* in the fields. Samples were taken from Sesame fields with variable ages and different irrigation systems. Ten plants were taken randomly from infested fields in different irrigation systems. Sesame pods were put into polyethylene bags after sampling. Information about the date of sampling, age, and the irrigation type of each sampling area was taken. The label information of the bags shows the date of sampling, the place where was taken, the rootstock name and age, and the irrigation type. These samples were brought to the plant Protection Laboratory, Faculty of Agriculture, New Valley University and all insects were counted manually using a manual counter. Mean diurnal temperature and relative humidity within inspected periods were considered as the tested meteorological factors for population analysis of insects. Records were obtained from the Meteorological Station located at El- Kharga City, New Valley.

Statistical analysis: Data collected were subjected to analysis of variance (ANOVA). The least significant difference (LSD) was used to compare means at P≤5%. Correlation tests were made using *A. catalaunalis* population density as the dependent variable and weather data as independent variable. Analysis Was Performed Using SPSS (Version 16.0).

Results and Discussion

The obtained results presented in Table (1) show the weekly average numbers of Larvae of the *A. catalaunalis* /100 pods during the first season of 2021 as well as the abiotic factors (temperature, relative humidity). It can be noticed that in the Flood irrigation, the leaf Webber infestation started in the second week of August by 25.00 and 17.67 larvae/100 pods in cultivars Sohag 1 and Shandawil 3 while in cultivars Toshka 1 and Giza 32 infestation started in the first week of August by 15.33 and 5.00, respectively at an average of min. and max temperature 25.6 °C and 44,6 °C and 20.0 % R.H. On the other hand, the population increased gradually to reach the highest average number in the third week of September 2021(70.00, 80.00, 77.67 and 66.00 Larvae/100 pods in cultivars Sohag 1, Shandawil 3, Toshka 1 and Giza 32, respectively) at an average of min. and max temperature 22.2 °C and 41, 4 °C and 29.0% R.H. Furthermore, in Drip irrigation, the infestation of *A. catalaunalis* started in the second week of August by 12.00 larvae/100 pods in a cultivar Giza 32 while in cultivars Sohag 1, Shandawil 3 and Toshka 1 infestation started in the first week of August by 7.33,1.667 and 10.00, larvae/100 pods respectively at an average of 28.2 °C and 43.2 °C min. and max. Temp and 25.0% R.H. On the other hand, the population increased gradually to reach the highest average number in the third week of September 2021(80.00, 70.00, 81.67 and 65.00 larvae/100 pods in cultivars Sohag1, Shandawil3, Toshka1 and Giza32, respectively) at an average of 41.4 °C and 22, 2 °C min. and max. temp and 29.0 % R.H.

Table 1. The effect of different irrigation types and sesame cultivars on population densities of *A. catalaunalis* in El-Kharga, New Valley, during 2021 season

Seasons		Avg. No. of larvae/ 100 pods										Mean
IRR	**Var.**	**2/8**	**9/8**	**16/8**	**23/8**	**30/8**	**06/9**	**13/09**	**20/09**	**27/09**	**02/10**	
Flood irrigation	**Sohag1**	0.00	25.00	43.33	35.33	45.00	41.67	65.33	70.00	83.33	75.00	**48.40**
	Shandawil3	0.00	17.67	38.33	53.33	60.87	84.67	57.00	80.00	43.33	65.00	**50.02**
	Toshka1	15.33	22.67	48.33	33.00	50.00	40.00	75.00	77.67	90.00	88.33	**54.03**
	Giza32	5.000	13.00	10.00	31.67	65.00	48.33	55.00	66.00	30.00	32.67	**35.67**
Mean		**5.083**	**19.58**	**35.00**	**38.33**	**55.22**	**53.67**	**63.08**	**73.42**	**61.67**	**65.25**	**47.03**
Drip irrigation	**Sohag1**	7.333	33.33	18.33	38.33	46.67	73.33	75.00	80.00	40.00	33.33	**44.57**
	Shandawil3	1.667	28.33	23.33	51.67	65.00	73.33	63.33	70.00	30.00	21.67	**42.83**
	Toshka1	10.00	18.33	15.00	50.00	56.33	75.00	66.33	81.67	40.00	63.33	**47.60**
	Giza32	0.000	12.00	7.000	32.00	63.00	41.00	53.00	65.00	25.00	3.333	**30.13**
Mean		**4.750**	**23.00**	**15.92**	**43.00**	**57.75**	**65.67**	**64.42**	**74.17**	**33.75**	**30.42**	**41.28**
V × D	**Sohag1**	3.667	29.17	30.83	36.83	45.83	57.50	70.17	75.00	61.67	54.17	**46.48**
	Shandawil3	0.833	23.00	30.83	52.50	62.93	79.00	60.17	75.00	36.67	43.33	**46.43**
	Toshka1	12.67	20.50	31.67	41.50	53.17	57.50	70.67	79.67	65.00	75.83	**50.82**
	Giza32	2.500	12.50	8.500	31.83	64.00	44.67	54.00	65.50	27.50	18.00	**32.90**
General Mean		**4.917**	**21.29**	**25.46**	**40.67**	**56.48**	**59.67**	**63.75**	**73.79**	**47.71**	**47.83**	
F test and LSD 0.05			**F test**			**LSD 0.05**						
IRR			**			0.2415						
Var.			**			0.3427						
IRR × V			**			0.4853						
Date			**			0.5428						
D × IRR			**			0.7659						
D × V			**			1.0833						
IRR × V × D			**			1.5341						

Data in Table (2) show the weekly average numbers of Larvae of *A. catalaunalis* /100 pods during the first season of 2022 as well as the abiotic factors (temperature, relative humidity). In the Flood irrigate on, the leaf Webber infestation started in the second week of August by 11.33,15.00 and 22.00

larvae/100 pods in cultivars Sohag 1, Toshka 1 and Giza 32, respectively. While in cultivar Shandawil 3 infestation started in the first week of August by 7.00 larvae/100 pods at an average of 24.8 °C and 41,8 °C min. and max. temp and 24.0% R.H. On the other hand, the population increased gradually to reach the highest average number in the third week of September 2021(56.33, 47.33, 85.67 and 70.00 larvae/100 pods in cultivars Sohag1, Shandawil3, Toshka1 and Giza32, respectively) at an average of 22 °C and 38 °C min. and max. temp and 33.0 Moreover, in Drip irrigation, the leaf Webber infestation started in the second week of August by 17.33,16.67 and 32.67 Larva in cultivars Sohag 1, Toshka 1 and Giza 32, respectively. While in cultivar Shandawil 3 infestation started in the first week of August by 4.33 larvae/100 pods at an average of 24.8 °C and 41,8 °C min. and max. temp and 24.0% R.H. On the other hand, the population increased gradually to reach the highest average number in the third week of August 2022(36.00, 76.00, 61.00 and 50.33 larvae/100 pods in cultivars Sohag1, Shandawil3, Toshka1 and Giza32, respectively) at an average of 23.2 °C and 44.6 °C min. and max. temp and 23.0 % R.H.

Table 2. The effect of different irrigation types and sesame cultivars on population densities of *A. catalaunalis* in El-Kharga, New Valley, during 2022 season

Seasons		Avg. No. of larvae/ 100 pods										Mean
IRR	**Var.**	**2/08**	**9/08**	**16/08**	**23/08**	**30/08**	**06/09**	**13/09**	**20/09**	**27/09**	**02/10**	
Flood irrigation	**Sohag1**	0.00	11.33	20.67	20.33	27.33	20.67	28.67	56.33	54.67	56.33	**29.63**
	Shandawil3	7.00	30.00	43.33	18.67	18.67	41.67	38.33	47.33	39.67	47.33	**33.20**
	Toshka1	0.00	15.00	27.67	27.33	38.67	31.33	50.67	85.67	77.33	85.67	**43.93**
	Giza32	0.00	22.00	23.33	31.67	33.67	43.33	45.00	70.00	62.33	42.67	**37.40**
Mean		**1.750**	**19.58**	**28.75**	**24.50**	**29.58**	**34.25**	**40.67**	**64.83**	**58.50**	**58.00**	**36.04**
Drip irrigation	**Sohag1**	0.00	17.33	33.33	36.00	32.00	16.33	13.67	20.00	17.33	8.33	**19.43**
	Shandawil3	4.33	25.33	34.67	76.00	44.00	24.00	16.33	17.33	14.33	15.67	**27.20**
	Toshka1	0.00	16.67	34.33	61.00	36.33	24.67	17.33	16.00	24.00	13.87	**24.42**
	Giza32	0.00	32.67	49.33	50.33	46.33	22.67	20.00	15.67	22.67	16.00	**27.57**
Mean		**1.083**	**23.00**	**37.92**	**55.83**	**39.67**	**21.92**	**16.83**	**17.25**	**19.58**	**13.47**	**24.65**
V × D	**Sohag1**	0.00	14.33	27.00	28.17	29.67	18.50	21.17	38.17	36.00	32.33	**24.53**
	Shandawil3	5.667	27.67	39.00	47.33	31.33	32.83	27.33	32.33	27.00	31.50	**30.20**
	Toshka1	0.00	15.83	31.00	44.17	37.50	28.00	34.00	50.83	60.67	49.77	**34.18**
	Giza32	0.00	27.33	36.33	41.00	40.00	33.00	32.50	42.83	42.50	29.33	**32.48**
General Mean		**1.417**	**21.29**	**33.33**	**40.17**	**34.63**	**28.08**	**28.75**	**41.04**	**39.04**	**35.73**	

F test and LSD 0.05	F test	LSD 0.05
IRR	**	0.3703
Var.	**	0.5244
IRR × V	**	0.7429
Date	**	0.8303
D × IRR	**	1.173
D × V	**	1.6606
IRR × V × D	**	2.346

Sesame cultivars differed significantly in their responses to infestations of *A. catalaunalis*. The highest level of infestation of *A. catalaunalis* was observed on Toshka 1 while the lowest level of infestation of *A. catalaunalis* was observed on Giza 32 during 2021. The highest level of infestation of *A. catalaunalis* was observed on Toshka 1 while the lowest level of infestation of *A. catalaunalis* was observed on Sohag 1 in Flood irrigation during 2022. Moreover, the highest level of infestation of *A. catalaunalis* was observed on Giza32 while the lowest level of infestation of *A. catalaunalis* was observed on Sohag 1 in Drip irrigation during 2022.Data also revealed the presence of a highly significant between population of the *A. catalaunalis* and irrigation systems (flood and drip). Sesame varieties irrigated by drip were less infestation of capsule borer than those irrigated by flooding.

Data in Table (3) show the Simple correlation coefficient between *A. catalaunalis* and two variables of weather factors during the two years of study, 2021 to 2022, El-Kharga, New Valley. The numerical values of the correlation co-efficient presented in the same table revealed that, the maximum and minimum temperature and relative humidity showed correlations (r= -0.592; -0.622; 0.634*, respectively) in Flood irrigation during 2021.

Table 3. Simple correlation coefficient between the population of *A. catalaunalis* and two variables of weather factors during 2021 and 2022 seasons

Seasons	Irrigation system	Correlation coefficient values "r"		
		Max. Temp. (c)	Min Temp. (c)	R.H. (%)
2021	Flood	-0.592	-0.622	0.634*
	Drip	-0.069	-0.140	0.196
2022	Flood	-0.233	-0.081	0.037
	Drip	0.306	-0.011	0.134

*Correlation is significant at the 0.05 level.

Irrigation systems and the environmental factors created can impact insect pests in units of production (Silva *et al*., 2019). Irrigation is one of the most important factors that control the productivity of the sesame crop, as it is a crop sensitive to irrigation and high-ground moisture. The stagnation of water in the field with high temperatures leads to the activity of insect pests and fungi and the thirst of plants mostly leads to their inefficiency in absorbing nutrients from the soil, which leads to weak plant growth and easy exposure to insect pest and diseases. In addition, increased humidity or thirst leads to the fall of flowers and newly formed pods. And this ultimately leads to a great shortage of the crop. Drip irrigation systems used in production are most regarded as the more promising irrigation system. The drip irrigation system is prepared to provide repeatedly low-volume irrigation to plants, conserve energy and labor moreover conserving water and minimize climate pollutants. Presently, the drip irrigation system has been used to deliver pesticides, and fertilizers including bio pesticides (Burelle *et al*., 2002). Furthermore, it is also recorded that the crop yield in the Drip irrigation system is higher compared with crops irrigated through conventional methods under similar situations (Brown *et al*., 2002). Drip irrigation keeps the soil warm and dry between the rows of planted plants, which may harm insect pests that need environments with moderately high humidity and temperatures to reproduce and develop (Rendon and Walton, 2019). Assis *et al*. (2012) found that Drip-irrigated coffee crops have fewer leaf miners than unirrigated ones. However, Daane and Williams (2003) recorded that high volumes of drip irrigation within vines may increase late-season leafhopper populations.

Additionally, Jiang *et al*. (2019) results showed that pesticides applied through drip irrigation mainly concentrated in leaves and provided effective control of cotton aphids, compared to other irrigation methods. And also, Natural enemy populations were higher in drip applied plants than in foliar sprayed plants. Gencsoylu *et al*., 2003 indicated that drip irrigation resulted in a lower number of 3rd and 4th instar whiteflies than furrow irrigation on cotton in Turkey,

Drip irrigation of pesticides represents an alternative method for integrated pest management (Ghidiu *et al*., 2012). Furthermore, several pesticides, such as anthranilic diamides and neonicotinoids were successfully applied via drip irrigation in pest control (Arrington *et al*., 2016).

References

Anyanga, W.O.; Hohl, K.H.; Burg, A.; Gaubitzer, S.; Rubaihayo, P.R.; Vollmann, J.; Gibson, P.T.; Fluch, S.; Sehr, E. M. (2017). Genetic variability and population structure of global collection of sesame (*Sesamum indicum* L.) germplasm assessed through phenotypic traits and simple sequence repeats markers for Uganda. J. Agric. Sci., 9:13–14.

Arrington, A.E.; Kennedy, G.G.; Abney, M.R. (2016). Applying insecticides through drip irrigation to reduce wireworm (Coleptera: Elateridae) feeding damage in sweet potato. Pest Manag. Sci. 72: 1133–1140.

Assis, G.A., Assis, F.A., Scalco, M.S., Parolin, F.J.T., Fidelis, I., Moraes, J.C. and Guimaraes, R.J., (2012). Leaf miner incidence in coffee plants under different drip irrigation regimes and planting densities. *Pesquisa Agropecuária Brasileira,* 47(2): 157-162.

Biabani AR, Pakniyat H (2008). Evaluation of seed yield- related characters in sesame (*Sesamum indicum L*.). Pakistan J BiolSci 11:1157-1160.

Boghdady, M.S., Nassar, R.M.A. and Ahmed, F.A. (2012) Response of sesame plant (*Sesamumorientale L*.) to treatment with mineral and bio- fertilizers. Res. J. Agric. and Biological Sci. 8(2): 127-137.

Burelle *et al*. (2002). Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions.

Couch A, Gloaguen RM, Langham DR, Hochmuth GJ, Bennett JM, Rowland DL. (2017). Non-dehiscent sesame (*Sesamum indicum L*.): Its unique production potential and expansion into the southeastern USA. J Crop Im prov 31: 101–172.

DAANE, K.M. and WILLIAMS, L.E., 2003. Manipulating vineyard irrigation amounts to reduce insect pest damage. Ecological Applications, 13(6):1650-1666. http://dx.doi. org/10.1890/02-5328.

Desai, B.B. (2004). Seeds handbook: biology, production, processing, and storage. 2nded. New York: Marcel Dekker.

Dossa, K.; Konteye, M.; Niang, M.; Doumbia, Y.; Cissé, N. (2017). Enhancing sesame production in West Africa's Sahel: A comprehensive insight into the cultivation of this untapped crop in Senegal and Mali. Agric. Food Secur., 6: 68.

El Naim A. M., Ahmed M. F., Ibrahim K. A. (2010). Effect of Irrigation and Cultivar on Seed Yield, Yield's Components and Harvest Index of Sesame (*Sesamum indicum* L.). Research Journal of Agriculture and Biological Sciences. 6(4): 492-497

FAO (2018). Statistical databases and datasets of the Food and Agriculture Organization of the United Nations [Available at URL: http://faostat.fao.org; accessed on 9th July 2018].

Gebregergis, Z.; Dereje, A.; Fitwy, I. (2016). Assessment of incidence of sesame webworm (*Antigastra catalaunalis* (Duponchel)) in Western Tigray, North Ethiopia. J. Agric. Ecol. Res. Int. 9: 1–9.

Gencsoylu, I., Horowits, A. R., Sezgin, F. and Oncuer, C. (2003). Phytoparasitica, 31: 139-143.

Geremedhin Z, Azerefegne F. (2020). Infestation and yield losses due to sesame webworm *Antigastra catalaunalis* (Duponchel) on different sesame varieties in Western Tigray, Northern Ethiopia. J Agric Ecol Res Int: 25–33.

Gharby S, Harhar H, Bouzoubaa Z, Asdadi A, El Yadini A, Charrouf Z. (2017). Chemical characterization and oxidative stability of seeds and oil of sesame grown in Morocco. J Saudi Soc Agric Sci 16: 105–111.

Ghidiu, G.; Kuhar, T.P.; Palumbo, J.C.; Schuster, D. (2012). Drip chemigation of insecticides as a pest management tool in vegetable production. J. Integr. Pest Manag., 3: E1–E5.

Ghidiu, G.; Kuhar, T.P.; Palumbo, J.C.; Schuster, D. (2012). Drip chemigation of insecticides as a pest management tool in vegetable production. *J. Integr*. *Pest Manag*.3: E1–E5.

Gupta, M.P., Rai, H.S. and Chourasia, S.K. (2002). Incidence and avoidable loss due to leaf roller/capsules borer, *Antigastra catalaunalis* Dup. in sesame. Ann. Plant Protect. Sci., 10: 202-206.

Jiang H, ; Hanxiang W. ; Jianjun C. ; Yongqing T. ; Zhixiang Z. and Hanhong X. (2019). Sulfoxaflor Applied via Drip Irrigation Effectively Controls Cotton Aphid (*Aphis gossypii* Glover). Insects, 10: 345.

Kavak H, Boydak E. (2006). Screening of the resistance levels of 26 sesame breeding lines to Fusarium wilt disease. Plant Pathol J 5: 157–160

Mahrous, N.M., Abu-Hagaza, N.M., Abotaleb, H.H. and Fakhry, S.M.K. (2015) Enhancement of growth and yield productivity of sesame plants by application of some biological treatments. American-Eurasian J. Agric. & Environ. Sci. 15(5): 903-912.

Nath, R., Chakraborty,P. , Bandopadhyay,P, Kunduand C. and Chakraborty, A. (2003).Analysis of relationship between crop growth parameters, yield and physical environment within the crop canopy of sesame (*Sesamum indicum* L.) at different sowing dates. Archives Agron. Soil Sci., 49: 677-682.

Patel, H.K., Patel, R.M., Desai, C.K. and Patel, H.B. (2014). Response of summer Sesamum (*Sesamum indicum* L.) to different spacings and levels of nitrogen under north Gujarat condition. Int. J. Agric. Sci. 10(1): 336-343.

Ram, M., Meena, R. C. and Sundria, M. M. (2021). Enhancing sesame productivity and profitability through zinc and iron application in western Rajasthan. *Pharma J*. 10: 924-28.

Rendon, D. and Walton, V.M., (2019). Drip and overhead sprinkler irrigation in blueberry as cultural control for *Drosophila suzukii* (Diptera: Drosophilidae) in northwestern United States. Journal of Economic Entomology,112(2): 745-752.

Shaban, K.A., Abd El-Kader, M.G. and Khalil, Z.M. (2012) Effect of soil amendments on soil fertility and sesame crop productivity under newly reclaimed soil conditions. Journal of Applied Sciences Research, 8(3): 1568-1575.

Shasmitha, R. (2015). Health benefits of *Sesamum indicum*: A short review. Asian J. Pharmaceutical and Clinical Res. 8(6): 1-3.

Silva, C.S.B., Price, B.E. and Walton, V.M., (2019). Water-deprived parasitic wasps (*Pachycrepoideus vindemmiae*) kill more pupae of a pest (*Drosophila suzukii*) as a water-intake strategy. Scientific Reports. 9(1): 3592.

Teklu, D.H.; Shimelis, H.; Tesfaye, A.; Abady, S. (2021). Appraisal of the sesame production opportunities and constraints, and farmer-preferred varieties and traits, in Eastern and Southwestern Ethiopia. Sustainability, 13, 11202.

Thapa, R.B. (2006). Honeybees and other insect pollinators of cultivated plants: a review. Journal of the Institute of Agriculture and Animal Science, 27: 1-23.

Tripathy, S.K.; Kar, J.; Sahu, D. (2019). Advances in Sesame (*Sesamum indicum* L.)Breeding.In Advances in Plant Breeding Strategies: Industrial and Food Crops; Al-Khayri, J.M., Jain, S.M., Johnson, D.V., Eds.; Springer: Cham, Switzerland, pp. 577–635.

Wei, P., F. Zhao, Z. Wang *et al*., (2022). Sesame (*Sesamum indicum L.*): a comprehensive review of nutritional value, phytochemical composition, health benefits, Development of Food, and Industrial Applications, Nutrients, 14(19): 4079.

Woldesenbet, D.T.; Tesfaye, K.; Bekele, E. (2015). Genetic diversity of sesame germplasm collection (*Sesamum indicum* L.): Implication for conservation, improvement and use. Int. J. Biotechnol. Mol. Biol. Res. 6, 7–18.

Xu, Y.D., Zhou, Y. P. and Chen, J. (2017). Near-infrared spectroscopy combined with multivariate calibration to predict the yield of sesame oil produced by traditional aqueous extraction process. J Food Qual, 1-5.

Yol, E.; Uzun, B. (2019). Inheritance of indehiscent capsule character, heritability and genetic advance analyses in the segregation generations of dehiscent x indehiscent capsules in sesame. Tarim Bilim. Derg. 25: 79–85.

استجابة بعض أصناف السمسم للإصابة بحشرة *Antigastra catalaunalis* (Lepidoptera: Crambidae) تحت ظروف الحقل ونظامي الري

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الملخص

يعد السمسم (*Sesamum indicum* L.) من المحاصيل الزيتية المهمة، ويزرع بشكل رئيسي للحصول على بذوره التي تستخدم في الأغراض الغذائية والطبية والصناعية. كان الهدف من هذه الدراسة هو تقييم تذبذب التعداد لأفراد حشرة (Lepidoptera: Crambidae) *A. catalaunalis* في أنظمة الري بالغمر والتنقيط في أصناف السمسم. أجريت التجربة في مزرعة معهد بحوث الوادي الجديد بمدينة الخارجة بالوادي الجديد بمصر خلال عامين متتاليين 2021 و2022. وكانت أصناف السمسم المزروعة هي (سوهاج 1، شندويل 3، توشكى 1، جيزة 32). أظهرت النتائج المتحصل عليها أن الإصابة بـ *A. catalaunalis* بدأت في الأسبوع الثاني من شهر أغسطس بواقع 25.00 و17.67 يرقات/100 قرن في الصنفين سوهاج 1 وشندويل 3 بينما بدأت الإصابة في الصنفين توشكا 1 وجيزة 32 في الأسبوع الأول من أغسطس بواقع 15.33 و5.00 يرقات/100 قرن على التوالي. ومن ناحية أخرى، ارتفع عدد الافراد تدريجيا ليصل إلى أعلى متوسط عدد في الأسبوع الثالث من سبتمبر. اختلفت أصناف السمسم بشكل كبير في استجاباتها للإصابة بحشرة *A. catalaunalis* وقد لوحظ أعلى مستوى للإصابة بـ *A. catalaunalis* في توشكى 1 بينما لوحظ أدنى مستوى للإصابة بـ*A. catalaunalis* في الجيزة 32. كشفت البيانات أيضًا عن وجود فروق ذات دلالة إحصائية كبيرة بين اعداد*A. catalaunalis* وأنظمة الري (الغمر والتنقيط). ان زراعة أصناف السمسم المتحملة للإصابة الحشرية ونظم الزراعة الحديثة تستطيع ان تلعب دوراً في تقليل الأضرار التي تسببها الآفات الزراعية وتقليل استخدام المبيدات الحشرية.