



Response of Certain Cultivars of Broad Bean to the Injury with Rodents at Assiut Governorate, Egypt

Baghdadi SAS¹ and Abd El-Aleem SSD^{2*}

¹Agric Zoology and Nematology Dept, Al-Azhar University, Egypt

²Plant protection Department, Sohag University, Egypt

***Corresponding author:** Abd El-Aleem SS Desoky, Plant protection Department, Faculty of Agriculture, Sohag University, Egypt, Email: abdelaleem2011@gmail.com

Received Date: January 28, 2021; **Published Date:** February 12, 2021

Abstract

This work was carried out to estimate the damages caused by rodents in seven cultivars of broad bean were Giza 716, Sakha 3, Nobaria 3, Giza 2, Giza 402, Giza 843 and Misr 3 during stages (parents, first generation and second generation) at the experimental farm at Al-Azhar University in Assiut Governorate during 2018/2019. The results showed that the average generation of Giza 843 cultivars was the least infested, while Misr 3 was the highest infested cultivars. Also, it became clear that there were significant differences between parents, first and second generation, that showed that parents were less infested, as well as the first generation was less infested than the second.

Keywords: Rodents; Seven Cultivars; Broad Bean; Parents; Generation

Introduction

Broad bean is common food Egypt part of daily diet [1]. Worldwide, rodents are a group of vertebrates that cause significant damage to a range of agricultural crops [2]. Most of the damage occurred between 80 to 120 days after planting [3]. Crop is damaged mainly by the three to four rat species which are considered economically important. At damages to field crops depends upon the cultivated crops, growth stage, the distance of the attacked plant from the border of the field and the rat density Pervez, et al. [4]. These results agree with El- Deeb, et al. [5] who recorded that the damage in some field crops i.e. maize, rice as summer crops and wheat, broad bean as winter crops due to rodent. The damage percentage was high in maize, rice as summer crops and wheat and broad bean as winter crops due to density of rats [6]. The study aims to measure the degree of infestation of rodents for seven cultivars of faba bean during the stage of parents and the first and second generation.

Materials and Methods

This study was carried out in Al-Azhar University Experimental Farm in Assiut, the chosen district contained many hundreds of feddans cultivated with varied field crops. This work was carried out to estimate the damage caused by rodents in seven cultivars of faba bean in the following stages (parents, first generation and second generation) during 2018/2019. Two feddans for each field crops were selected to achieve this study For this study twenty five samples were taken from each plot, by using quadrat wooden frame (100×100cm²), with five replicates for each level. The attacked plants were estimated as average number of broad bean from the total examined plants in each distance. The number of damaged and undamaged plants inside the frame for every single sample was counted. From the maturity stage till the harvest the average infestation of the plant and the loss pods were estimated in each area as percent of infested plants from the total examined plants, then the data

were analyzed statistically. The species of rodent prevailed in the field study were trapped and identified.

Results and Discussion

During the study results showed that identification of rats inhabited faba bean field show that the field rat *Arvicanthus Niloticus* (field rat or Nile grass rat) was only rodent species prevailing in the area and responsible for faba bean and working near sources of water in the canals, so the rat population at the outer border of more fields and decreased gradually towards the center [7]. Data in table 1 and Figures 1-3 also showed the least infested species in the parents stage was Giza 843 (0.10), followed by Giza 716 (0.22),

followed by Sakha 3 (1.14), and the least infected types in the first generation were Giza 716 (0.70), followed by Giza 843 (0.72), followed by Sakha 3 (1.37), while the least-infested species in the second generation stage were Giza 402 (0.71), followed by Giza 843 (1.57), followed by Nobaria 3 (2.14). It was also evident that there were significant differences between parents, first and second generation, that showed that parents were less affected, and the first generation was less affected than the second may be due to the parent stage is always more tolerant to infection than rodents than the following generations, because it contains fibers, it is not preferred for feeding rodents. The results agreement with Korany [8], Brown, et al [2]. El-Deeb, et al. [5] & Hany [9].

Varieties	Stages	Non infested	Infested	Percentage	Mean
Giza 716	P	305.33	0.67 jk	0.22	1.14
	F1	334.33	2.33 hij	0.7	
	F2	332	8.33 b	2.51	
Sakha 3	P	320.33	3.67 ghi	1.14	2.03
	F1	315.33	4.33 efg	1.37	
	F2	289.33	10.33 a	3.57	
Nobaria 3	P	255.67	3.67 ghi	1.43	1.79
	F1	280	5.00 defg	1.79	
	F2	281	6.00 de	2.14	
Giza 2	P	277.33	4.00 fgh	1.44	1.85
	F1	287	5.67 def	1.97	
	F2	310.33	6.67 bcd	2.15	
Giza402	P	286.67	8.00 bc	2.79	1.85
	F1	310	6.33 cd	2.04	
	F2	280.67	2.00 ijk	0.71	
Giza843	P	332	0.33 k	0.1	0.8
	F1	322	2.33 hij	0.72	
	F2	338.67	5.33 defg	1.57	
Misr 3	P	304.33	4.00 fgh	1.31	2.18
	F1	329	6.33 cd	1.93	
	F2	333	11.00 a	3.3	

Table 1: Average numbers of infested pods / m² of certain cultivars of broad beans by rodents at different sampling during (2018).

P= parents stage

F1= first generation

F2= second generation

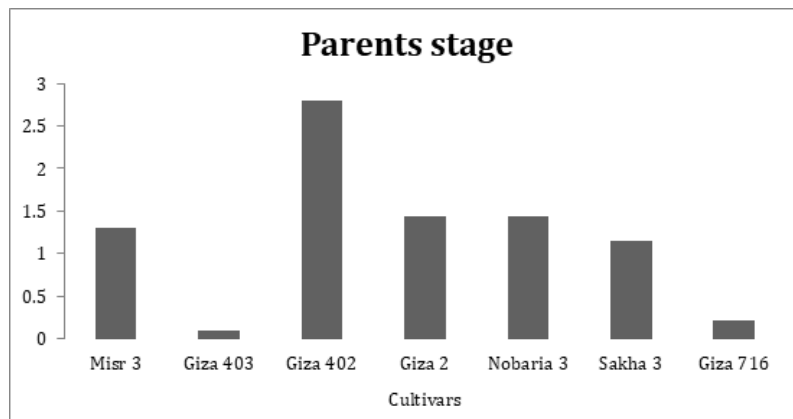


Figure 1: The percentage of infestation from rodents to seven cultivars of broad beans in the stage of parents.

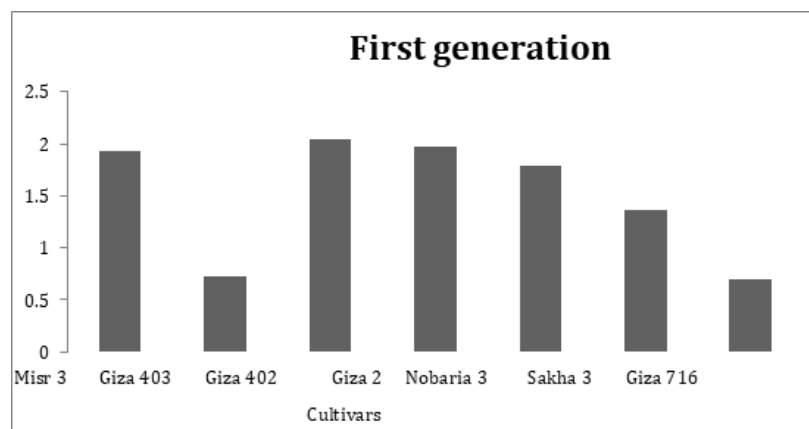


Figure 2: The percentage of infestation from rodents to seven cultivars of broad beans in the first generation.

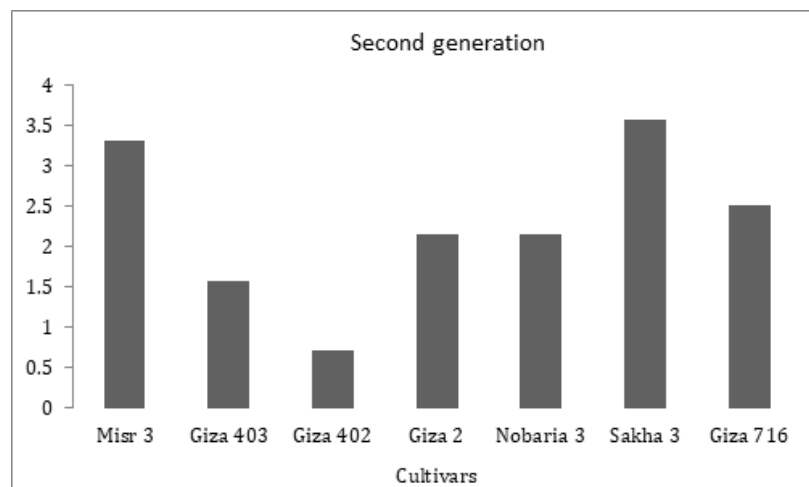


Figure 3: The percentage of infestation from rodents to seven cultivars of broad beans in the second generation.

Conclusion

Arvicanthus Niloticus was only rodent species prevailing in the area and responsible for faba bean and working near sources of water in the canals, so the rat population at the outer border of more fields and decreased gradually towards the center. High damage caused by rodent was observed in Masr-3 cultivar compared with Giza-843.

Recommendation

Can be recommended, the cultivation of the following cultivars of faba bean, because they are the least infested species for rodents, especially in the parent stage and the first generation stage, which is Giza 843, Giza716 and Sakha 3 in Assiut region. It may be due to contain of fibers that are not preferred for feeding rodents, as well as less-affected cultivars

References

1. Abdel-Rahman MK, Ahmed LA (2012) Effects Of Dietary Broad Bean And Red Onion Intake On Weight Loss Properties In Obese Rats. *Egypt J of Nutrition and Health* 7(1): 99-112.
2. Brown PR, Huth NI, Banks PB, Singleton GR (2007) Relationship between abundance of rodents and damage to agricultural crops. *Agriculture, Ecosystems and Environment* 120(2-4): 405-415.
3. Parshad VR, Malhi CS, Ahmad N, Gupta B (1987) Rodent Damage and Control in Peanut Fields in India. *Peanut Science* 14(1): 4-6.
4. Prevez A, Ahmed SM, Khan A, Lathiya SB (2005) Comparative Field Efficacy of Some Additive Formulated Baits Against Rodent Pests of Wheat Crop in Sindh, Pakistan. *Pakistan J Zool* 37(4): 269-274.
5. El-Deeb HI, Abd-elkader MR, Gabr WM, Ahmed HAA (2008) Rodenticidal Efficiency of Certain Compounds against *Rattus norvegicus* and *Rattus rattus alexandrinus*. *Egypt J Agric Res* 86(2).
6. Ahmed HAA (2007) Ecological and Toxicological studies on some domestic rodent species prevailed in Buildings. M.Sc. thesis. Fac Agric Al Azhar Univ. Egypt.
7. Abdel-Gawad KH, Maher AA, Salit AM (1982) Assessment of damage caused by rodents in some field crops. *Assiut J Agri Sci* 13(2): 73-78.
8. Korany HS (2006) Damage caused by rodent on some field crops in Upper Egypt and its control. M. Sc. Thesis, Fac Agric Al- Azhar University. pp: 109.
9. Hany AAA (2017) Evaluation of Rodenticide Bromadiolone and Chlorophacinone in Controlling Rodent Infestation at Al-Wadi Al-Gadeed Governorate in Egypt. *Egypt Acad J Biolog Sci* 9(1): 41-48.