



## Economic Losses Caused by Rodents in Some Types of Maize Fields at Farshout District, Qena Governorate, Egypt

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### Abstract

This study was conducted to estimate the quantitative damage caused by rodent infestation to some types of maize and its financial transfer, at Al-Dahsa village in Farshout district, Qena Governorate, Egypt, during study period 2018 / 2019. The percentage of the quantitative and economic losses in maize varieties caused by rodents show that the highest value of loss was recorded in genotype single cross (HYTECH2066) were about (3.91 and 3.00 Ardab/ feddan with a value of about (2737 and 2100 pounds), followed by the (Balady) type with about ( 3.90 and 2.34 Ardab/ fed.,) with a value of about (2730 and 1638 pounds), followed by the single hybrid genotype (HYTECH 2055) about (3.26 and 2.57 Ardab/ fed.,) with a value of about (2282 and 1799 pounds), while the moderate loss was recorded in crossbreeding Triple genetic (National seeds 11 "National seeds company") about (2.40 and 2.10 Ardab/ fed.,) with a value of about (1608 and 1407 pounds), followed by the three-way genotype (National seeds 310) with about (2.30 and 1.84 Ardab/ fed.,) with a value of about (1541 and 1233) pounds, while the lowest value was recorded in the individual genotype (National seeds 6) with about (1.30 and 1.04 Ardab/ fed.,) with a value of about (871 and 697 pounds), followed by the individual hybrid genotype (National seeds 4), about (1.50 and 1.20 Ardab/ fed.,) with a value of about (1005 and 804 pounds). The study indicates the interest in agricultural operations, taking preventive measures and implementing appropriate control programs for the maize varieties most infested with rodents.

**Keywords:** Rodent Infestation; Financial Transfer; Type of Maize; Ardab; Feddan

### Introduction

Maize (*Zea mays* L.) is the third most cereal crop in the world, providing nutrient of humans and animals. The behavior of rodents can vary widely from place to place. Maize crop fields recorded as suitable host to rodent pests by many workers in the world [1-8]. Rodents are considered one of the most important pests in Egypt. They cause great economic losses to farmers (destroying agricultural crops

and stored products [9]. The study aims to know the material losses resulting from the infestation of rodents for the most important types of maize.

### Materials and Methods

This study was conducted over two consecutive years (2018 and 2019). The field experiment was conducted in Al-Dahsa village, Farshout District, Qena Governorate - Egypt.

The damage caused by rodents was evaluated for the most important varieties of maize, namely HYTECH 2066, Balady, HYTECH 2055, National seeds 11, National seeds 310, National seeds 6 and National seeds 4. Damage to rodent species was monitored in the field, based on the frequency of encountering corn cob damage until harvest time. The direct counting method was used in order to determine the damages of rodents. Thirty plants were randomly sampled from the field of each replicate and crop damage was measured. Half feddan each treatment of maize during two successive years was chosen to this experiment. Samples from each experiment were 30 plants representing five randomized replicates.

The degree of damage due to rodent species in the ears was estimated according to Hamelink [10] by using the following equations:

$$\text{Damage (\%)} = \frac{0.0 \times S_1 + 0.25 \times S_2 + 0.50 \times S_3 + 0.75 \times S_4 + 1.0 \times S_5}{N} \times 100$$

Where:

$S_1$  = No of undamaged corn cob;  $S_2$  = No. of 1/4 damaged corn cob;  $S_3$  = No. of 1/2 damaged corn cob;  $S_4$  = No. of 3/4 damaged corn cob;  $S_5$  = No. of complete damaged corn cob;  $N$  = Total Number of investigated corn cob.

The losses caused by the rodents were calculated for each training/feds and then transferred financially.

## Results and discussion

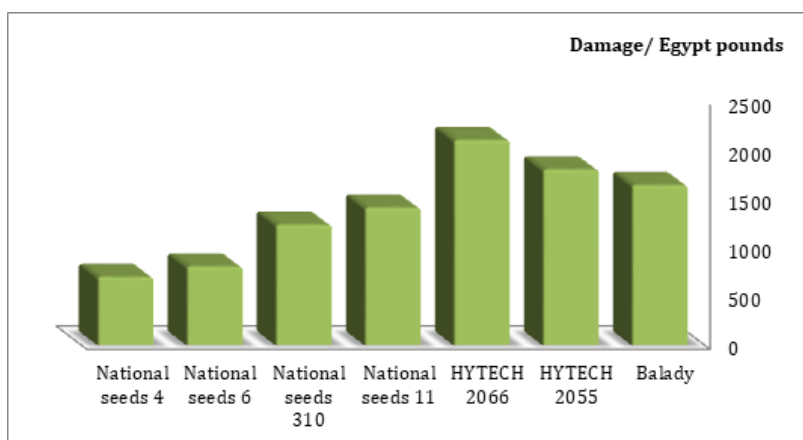
Data presented in Tables 1 & 2 and Figures 1 & 2 showed that, the value of loss (quantitative) in cultivars of maize at two successive years at Qena Governorate. The percentage of economic losses caused by rodents show that the highest value of loss was recorded in genotype single cross (HYTECH 2066) was about (3.91 and 3.00 Ardab/ fed.,) worth about (2737 and 2100 pounds), representing about (17.00 and 15.17%) of the total production as a result of rodents attack

in the case of cultivation alone, followed by Balady was about (3.90 and 2.34 Ardab/ fed.,) worth about (2730 and 1638 pounds), representing about (20.50 and 19.50%) of the total production as a result of rodents attack in the case of cultivation alone, followed by genotype single cross (HYTECH 2055) was about (3.26 and 2.57 Ardab/ fed.,) worth about (2282 and 1799 pounds), representing about (14.83 and 13.50%) of the total production as a result of rodents attack in the case of cultivation alone at the first and second years respectively. While the moderate value of loss was recorded in the genotype three way cross (National seeds 11) was about (2.40 and 2.10 Ardab/ fed.,) worth about (1608 and 1407 pounds), representing about (11.50 and 11.00%) of the total production as a result of rodents attack in the case of cultivation alone, followed by genotype three way cross (National seeds 310) was about (2.30 and 1.84 Ardab/ fed.,) worth about (1541 and 1233 pounds), representing about (10.83 and 9.67%) of the total production as a result of rodents attack in the case of cultivation alone at the first and second years respectively.

While the least value of loss was recorded in the genotype single cross (National seeds 6) was about (1.30 and 1.04 Ardab/ fed.,) worth about (871 and 697 pounds), representing about (4.83 and 4.50%) of the total production as a result of rodents attack in the case of cultivation alone, followed by genotype single cross (National seeds 4) was about (1.50 and 1.20 Ardab/ fed.,) worth about (1005 and 804 pounds), representing about (6.17 and 6.00%) of the total production as a result of rodents attack in the case of cultivation alone at the first and second years respectively. The results similar with Metwally, et al. [7] found the losses to maize crop by large jird *Meriones shawi* (Thomas) were about 2Ardab/ fed., and decreased to 0.9 Ardab/ fed., At El-Behria Governorate, during 2001 and 2002 agriculture seasons, respectively. This study informs the future interest in the prevention of corn varieties most infested with rodents and the work of an integrated control program to reduce or prevent rodent infestation.

No.	Maize types	Ave. fadden yield/ Ardab	Damage %	Damage/ Ardab	Ave. Ardab price/ EGP	Damage/ Egypt pounds
1	Balady	19	20.5	3.90	700	2730
2	HYTECH 2055	22	14.83	3.26	700	2282
3	HYTECH 2066	23	17	3.91	700	2737
4	National seeds 11	21	11.50	2.40	670	1608
5	National seeds 310	21	10.83	2.30	670	1541
6	National seeds 4	24	6.17	1.5	670	1005
7	National seeds 6	27	4.83	1.3	670	871
Mean		22.43	12.24	2.65	682.86	1824.86

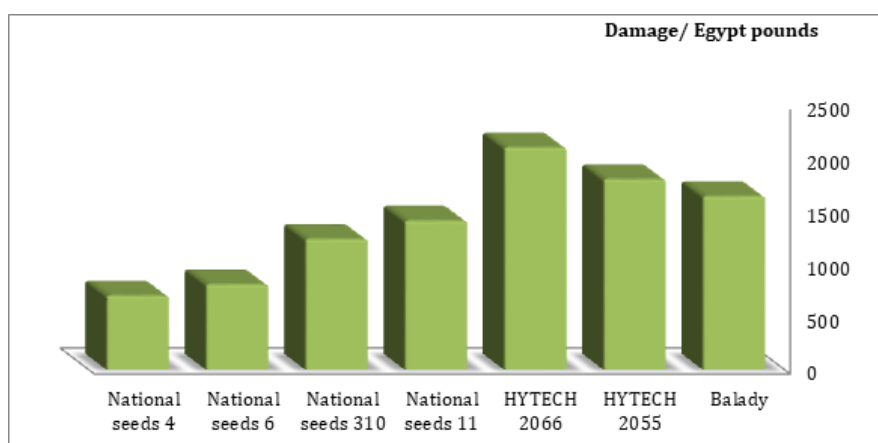
**Table 1:** Average percentage of economic losses caused by rodents in some types of maize at Qena Governorate (2018).



**Figure 1:** Average percentage of economic losses caused by rodents in some types of maize at Qena Governorate (2018).

No.	Maize types	Ave. fadden yield/ Ardab	Damage %	Damage/ Ardab	Ave. Ardab price/ EGP	Damage/ Egypt pounds
1	Balady	12	19.5	2.34	700	1638
2	HYTECH 2055	19	13.5	2.57	700	1799
3	HYTECH 2066	20	15.17	3	700	2100
4	National seeds 11	19	11	2.1	670	1407
5	National seeds 310	19	9.67	1.84	670	1233
6	National seeds 4	20	6	1.2	670	804
7	National seeds 6	23	4.5	1.04	670	697
Mean		18.86	11.33	2.01	682.86	1382.57

**Table 2:** Average percentage of economic losses caused by rodents in some types of maize at Qena Governorate (2019).



**Figure 2:** Average percentage of economic losses caused by rodents in some types of maize at Qena Governorate (2019).

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