

## **DAMAGE ASSESSMENT CAUSED BY RODENT TO CERTAIN CROPS IN DAKAHLIA GOVERNORATE.**

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### **ABSTRACT**

Field studies had been carried out to estimate the damage caused by rodents on wheat, tomatoes (winter crops) and rice, maize (summer crops) in Mansoura and Aga districts, Dakahlia governorate during 2005 season.

The obtained results could be summarized as follows: Wheat crop was attacked heavily by field rodents during the milky and dough stages, with total damage percentage of 2.62 % and 2.15 %, while reached to 2.89 % and 2.44 % on tomato crop. in Aga and El-Mansoura districts resp.

The total damage percentage on summer crops were (1.84 & 1.67 ) for maize crop, while percentages were (1.47 & 1.77) for rice crop in Aga and El-Mansoura districts.

### **INTRODUCTION**

Rodents attack the germinating seeds in seed beds and cause extensive damage. As the plant becomes older, the rats cut tillers and eat portions of the developing head (Alfonso, 1968). FAO estimated that 5 % of food production was lost and this enough to feed 130 million people (Parkin, 1959).

Rodents cause on economic loss to farmers, food manufacturers and processors as well as causing damage to the structure and buildings fabric. Undoubtedly by the economic loss due to rodents is enormous particularly in the tropics, but it is impossible to exact monetary values on the damaged caused. (Asran and Abd El-All, 2006).

The present work aimed to estimate the damage caused by rodents to wheat, rice, maize and tomato crops at Mansoura and Aga districts, Dakahlia Governorate.

### **MATERIALS AND METHODS**

The damage assessment technique caused by rodents were done on wheat (*Triticum vulgare*), tomato (*Lycopersicon esculentum*) as winter crops and maize (*Zea mays*), rice (*Oryza sativa*) as summer crops. Aga and Mansoura districts, Dakahlia Governorate were chosen as experimental area. The field trials continued for successive years 2005. Techniques used by many authors *a.i* El-Deeb *et al.* (1985), Kuehnert, (1988), Asran, (1991), Wahab *et al.*(1997) and Asran *et al.* (2000) were as follows:

Ten wheat fields each of 2 feddans were randomly chosen. In each field 25 samples were investigated by using quadrat wooden frame (40 × 40 cm) on the diagonal of the field at fixed distance according to its length. The number of damaged and undamaged tillers inside the frame for every single spot were counted. The damage percentage was calculated according to Poche *et al.* (1982) by equation:

$$\% \text{ Damage} = \frac{\text{Number of damaged tillers}}{\text{Total number of investigated tillers}} \times 100$$

Ten tomatoes fields each one feddan were selected randomly at each district. The rows in each one feddan area were counted and divided by 10. The results and their duplicates were the number of sampling rows. For each sampling row, the damaged and undamaged fruits in 30 successive plants were counted and recorded. The identification of damage rate was done as described by Asran *et al.* (1985). The damage percentage was calculated as follows:

$$\% \text{ Damage} = \frac{\text{No. of damage fruit}}{\text{Total No. of investigated fruit}} \times 100$$

Ten maize fields each 2 feddan were randomly chosen in each district. Ten samples each containing 30 maize plants were randomly chosen and checked to estimate the degree of damage in their ears according to Hamelink, (1981). The damage percentage were calculated using the following equations:

$$\% \text{ Damage intensity} = \frac{i_1 \times s_1 + i_{II} \times s_{II} + \dots + i_x \times s_x}{N} \times 100$$

Where : *i* = damage incidence expressed by the number of damaged ears severity class ( I = 0 %, II = 25 %, III = 50 %, IV= 75 % and V = 100 % grain missing).

*s* = damage severity for each class (*i* = 1,2,3.....ect.)

*N* = total number of sampled ears.

## **RESULTS AND DISCUSSION**

Data in Table (1), indicated that the damage percentage caused by rodents in wheat crop was 0.0 % at the early growth stage in the two districts. The damage increased in February to 0.31 % and 0.23 % at Aga and El-Mansoura districts, respectively. In March, April and May losses increased gradually until reached to their maximum in May month, losses were (0.61 % , 0.73 % and 0.97% ) and (0.55 %, 0.63 % and 74 %) in Aga and El-Mansoura districts, respectively. These data indicate clearly that the wheat

crop was attacked heavily by field rodents during the milky and dough stages, with total damage percentage of 2.62 % and 2.15 % in Aga and El-Mansoura districts.

**Table (1): Damage percentage caused by rodents to certain winter crops in Aga and El-Mansoura districts, during 2005 season.**

District	Crop	Mean of the losses percentage					Total	Mean ± S.E
		Jan.	Feb.	Mar.	Apr.	May		
Aga	Wheat	0.0	0.31	0.61	0.73	0.97	2.62	0.52 ± 0.16
	Tomato	0.32	0.64	0.71	0.89	0.35	2.89	0.57 ± 0.11
El-Mansoura	Wheat	0.0	0.23	0.55	0.63	0.74	2.15	0.43 ± 0.13
	Tomato	0.28	0.41	0.83	0.52	0.40	2.44	0.49 ± 0.09

The damage percentages on tomato crop were 0.32, 0.64, 0.71, 0.89 and 0.35 in Aga district while losses were 0.28, 0.41, 0.83, 0.52 and 0.40 % in El-Mansoura district with total damage percentage of 2.89 % and 2.44 % in the before mentioned districts.

The obtained data in Table (2) showed that the rodent damage percentage on summer crops showed the same trend with slight differentiation of winter crops, the early growth stage has slight damage were 0.30 % and 0.19 % for maize and (0.11 % and 0.19 %) for rice crop on July month at Aga and El-Mansoura districts. While losses percentages increased (0.73 & 0.81 ) and (0.67 & 0.86 ) on maize crop . Also, damage percentages were (0.28 & 0.32 ) and (0.43 & 0.56 ) for rice crop in Aga and El-Mansoura districts during August and September months 2005 season, respectively.

**Table (2): Damage percentage caused by rodents to certain summer crops in Aga and El-Mansoura districts, during 2005 season.**

District	Crop	Mean of the losses percentage				Total	Mean ± S.E
		July	Aug.	Sep.	Oct.		
Aga	Maize	0.30	0.73	0.81	0.0	1.84	0.46 ± 0.17
	Rice	0.11	0.28	0.43	0.65	1.47	0.37 ± 0.11
El-Mansoura	Maize	0.14	0.67	0.86	0.0	1.67	0.42 ± 0.19
	Rice	0.19	0.32	0.56	0.70	1.77	0.44 ± 0.12

The total damage percentage on summer crops were (1.84 & 1.67 ) for maize crop, while percentages were (1.47 & 1.77) for rice crop in Aga and El-Mansoura districts.

These results are in agreement with the finding by many authors . Asran, (1991) reported that rodent damage to wheat in its early stages was 0.19 % ( in January). The wheat crops gets heavily attacked by rats during milky and dough stages. Wheat, sugar-cane and maize were the most preferred for the Nile rat *Arvicanthis niloticus* in Minia Governorate. El-Deeb, *et al.* (1990) found that the level of wheat infestation varied between 5.43 % in the field edge and 1.88 % at diagonal in Dakahlia Governorate. While Kalubia and Beni-suef Governorate were (11.01 % and 10.32 %) in the field edge and (3.11 & 2.84 %) in the diagonal.

## REFERENCES

- Alfonso, P. J. (1968): Rice damage by rats in the Philippines (Asia – Pacific interchange Proc.), Rodents as factors in disease and economic loss Honolulu, Hawaii, June 17 – 27, 1968, 53 – 54.
- Asran, A.A. (1991): Chronology of damage appraisal in some field crops caused by the Nile rat, *Arvicanthis niloticus* in Minia Governorate. Fourth Arab Congress of Plant Protection – Cairo, 1-5 Dec., 1991 pp: 509 – 512.
- Asran, A.A.; El-Deeb, H.I. and Kuehnert, G. (1985): Rat damage assessment in Vine trees and orchard of apricots and plums. J. Agric. Sci. Mansoura Univ. Egypt. 10 (2): 573 – 575.
- Asran, A.A. and Abd El-All, S.M.(2006): Efficiency of certain anticoagulant rodenticides on albino Norway rat, *Rattus norvegicus*. J. Agric. Sci. Mansoura Univ. 31 (2): 1061 – 1069.
- Asran, A.A.; Metwally, A.M.; Ahmed, M.M.; Moafi, M.H. and El-Nashar, M.A. (2000): Survey and damage appraisal of rodents in certain field crops in Minia Governorate. Al-Azhar J. Agric., Res., Vol. 32: 207 – 216.
- El-Deeb, H.I., Asran, A.A. and El-Halfawy, M.A.(1990): Pre-harvest damage and active burrows of rats in wheat fields. Agric. Res. Rev. 68 : 229 – 233.
- El-Deeb, H.I., Asran, A.A., Kuehnert, G. and El-Halfawy, M.A.(1985): Damage caused by rats to tomatoes, strawberry, squash and peas in some Delta Governorate. J. Agric. Sci., Mansoura Univ., 10 (4): 1525 – 1526.
- Hamelink, J. (1981): Assessing rat damage and yield losses in sugar-cane, rice and maize. Book of Rodent Pests and their Control. Published in July 1981 by German Agency for Technical Cooperation (GTZ).
- Kuehnert, G. (1988): Field rats and their control in Egypt. Analysis of a national rodent control Strategy. Final report (Sept. 1982 – Aug. 1988). Egyptian German Field Rat Control Project. 118 pages.
- Parkin, E.A. (1959): Insect and stored food world losses and control measures surveyed. Food Manul. 34 : 164 – 168.
- Poche, R.M., Moin, M.Y.; Haque, M.E. and Sultana, P. (1982): Rodent damage age and burrowing characteristics in Bangladesh wheat fields. J. Wild. Manag. 46: 139 – 147.
- Wahab, A.E.; Asran, A.A. and Keshta, T.M. (1997): Survey and damage appraisal of Egyptian rodents in certain field crops in some governorates. Al-Azhar J. Agric., Res., 25: (1): 261 – 268.

## تقدير الخسارة التي تسببها القوارض لبعض المحاصيل فى محافظة الدقهلية

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تم تنفيذ دراسة حقلية لتقدير الخسائر التي تسببها القوارض لبعض المحاصيل الحقلية ، فى محافظة الدقهلية بمركزى أجا والمنصورة خلال المدة من شهر يناير حتى أكتوبر ٢٠٠٥ م وكانت النتائج كالآتى :

تمت الدراسة على محصول القمح والطماطم كمحاصيل شتوية ، حيث كانت نسبة الفقد الكلية فى محصول القمح ٢,٦٢ % فى مركز أجا بينما كانت ٢,١٥ % فى مركز المنصورة . كذلك كانت نسبة الفقد فى ثمار محصول الطماطم ٢,٨٩ % و ٢,٤٤ % فى مركزى أجا والمنصورة على التوالى.

أما فى المحاصيل الصيفية ، فقد بلغت نسبة الفقد الكلية التي تسببها القوارض لمحصول الذرة الشامية ١,٦٧ % و ١,٨٤ % فى مركزى أجا والمنصورة ، كذلك كانت نسبة الفقد فى محصول الأرز ١,٤٧ % و ١,٧٧ % فى مركزى الدراسة .