

## **WILD BIRDS INJURIOUS TO SOME FIELD CROPS AT ISMAILIA GOVERNORATE UNDER FIELD CONDITIONS**

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### **ABSTRACT**

The wild bird species, cause serious damage to many field crops during both sowing and maturing stages. Wild birds began attacked the wheat crop after the second week of the panicles emergence. The dough stage recorded the highest percentage of damage with 9.19, 8.58 and 7.85 % at fields beside orchard, vegetables and crops respectively. While the lowest damage was recorded in the milky stage. Bird damage on Maize fields increased throughout the weeks after silking and during the development and grains growth till the sixth week, then decreased in the seventh week with value, 8.45 and 6.52 % respectively, while the lowest value at the second week with 4.57 %. Also there was highly significant difference between weeks. Birds attacked tomato during maturity stage with values 5.72, 7.64, 8.36, 7.60, 7.77, 6.49 and 5.04 % during the seven weeks from starting Maturing and Marketing.

**Keywords:** Damage, wild bird, field crops and vegetable crops

### **INTRODUCTION**

Agriculturalists have long been concerned with crop losses due to blackbirds (Icteridae) in the United States. This concern has been particularly true for Ohio, which has the highest breeding season density of red-winged blackbird (*Agelaius phoeniceus*) of any state Dolbeer 1980.

The most bird damage to wheat field occurred within the milky and dough stages and decreased within the mature stage (El- Deeb, 1991). Losses due to birds considerably differed among the different varieties of broad bean and wheat regarding their external and internal characters (Lokma, 1992). On the other hand most bird damage was recorded during the dough stage of the different tested crops. Sorghum and sunflower were damaged severely by birds, while the lowest damage occurred at maize crop (Khattab, 1993). Rice crop was the most preferable one to the bird attack (17.1 %) followed by wheat crop (14.5 %) barely crop (12.5 %) broad bean (9.2 %) while maize crop was the lowest one (5.4 %). On the other hand dough stage of the different crops exhibited a highly vulnerability to bird attack (5.98 %) followed by milky stage (3.18 %) while mature stage was lowest preferable one (2.56 %) (Soliman, 1993). The house sparrow, *Passer domesticus niloticus* (L.) is one of the most important agricultural pests in the cultivated areas in Egypt. These birds consume many crops especially cereal grains such as wheat and sorghum in addition to rice, broad bean, sunflowers and grapes Metwally *et al.*, 1995 and Omar, 2010. Pigeon bird ( *Columb livia*) infested lens crop during mature stage (Ghamry *et al.*, 1999). House sparrow *Passer domesticus niloticus*, caused significant damage to wheat varieties

during its ripening stages. The highest accumulative damage occurred after 36 days. The bird damage increased and grains of wheat were most depleted at the period from 20 and 36 days after the panicles were completely emerged. The initial damage was recorded after 12 days (Khattab *et al.*, 2001). Birds attacked the roots of seedlings or seeds after sowing and horticultural crops such as tomato, strawberry and apple during the maturing stage and marketing and caused damage with highest values 10.57, 5.57 and 5.48% at the third week from the beginning of the harvest of each crop respectively. Maturing stage of maize during the period 35 to 42 days after silking with recorded values 13.21 and 13.90% in ears without pruning (Khattab *et al.*, 2002). Incident of damage are caused by house sparrow *Passer domesticus niloticus*, hooded crow *Corvus corone sardonius* and palm dove, *Streptopelia senegalensis egyptica* and other bird species Abdel-Gawad *et al.*, 2004; EL-Danasory, 2006 and Hassan-Eman, 2008. The present work threw light on the damage caused to the field crops at Ismailia Governorate.

## **MATERIALS AND METHODS**

### **Bird damage assessment to different crops :**

Bird damage to the ripening stages of wheat, Maize and Tomato was assessed under field conditions at Ismailia Governorate. Data were analyzed according to (Sendecor, 1956), (Steel & Torrie, 1980) and Duncans multiply range test Duncans (1955).

### **Damage assessment on wheat:**

In wheat crop the damage assessment was carried out in three districts, (i.e. Eltel Elk beer, Fayed and EL-Qantara) with three locations, (i.e. near by Fruit orchard, Field crops and near by vegetables).

Two feddans cultivated with wheat crop were randomly chosen in each investigated location. Twenty replicates carried out for each treatment. Sampling was done according to the methods adopted by (Poche *et al.*, 1982). A wooden square meter frame was used for sampling from the selected fields. The number of damaged and undamaged ears that came within the frame was recorded.

The percentage damage to each ear was scored in different categories according to De-Haven (1974):

- Category 1= 10 % level (1-20 % damage).
- Category 2= 30 % level (21-40% damage).
- Category 3= 50 % level (41-60% damage).
- Category 4= 70 % level (61-80% damage).
- Category 5= 90 % level (81-100 % damage).

Percentage of damage was calculated as follow:

$$\% \text{ Damage} = \frac{C \times 100}{T}$$

Where:

C = undamaged x 0.0+ 10 % damage x 0.1+ 30 % damage x 0.3+ 50 % damage x 0.5+ 70 % damage x 0.7+ 90 % damage x 0.9

T = Total investigated heads.

**Damage assessment in Maize:**

The damage assessment was carried out in two location, (i.e. near by field crops and near by vegetables) in the three districts mention before. Twelve cultivated fields with Maize crop, each of 2 feddans, were randomly selected. These fields were divided randomly into 20 sub samples (a proximately 200 m each), in each, 30 successive plants were inspected to estimate the degree of damage in the investigated cubs (EL-Deeb, 1991).

The degrees of damage due to bird species in the ears were estimated according to (Hamelink 1981). (0.0, 0.25, 0.50, 0.75 and 1.0).

The damage percentage was calculated by using the following equations:

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

Where:

S = No of damaged ears for each class

N = Total Number of investigated ears.

**Damage assessment in Tomato:**

Chronology of bird damage to tomato was conducted weakly from the starting of maturity and marketing till the end of harvest under the field condition of Eltel Elkbeer and Fayed district in two locations, (i.e. near by field crops and near by vegetables). Four treatment in each location were randomly chosen, and twenty samples were chosen randomly from each treatment, each consisting of 10 consecutive plants in one row, established for assessment of damage, the same method of (Hamelink 1981) was followed and the damage and undamaged berries were counted and the percentage calculated as follow:

$$\% \text{damage} = \frac{\text{No of damage} \times 100}{\text{Total No of damage and undamaged}}$$

## **RESULTS AND DISCUSSION**

**Wild bird damage to some field crops:**

Problems associated with wild bird's damage to agriculture were more common in recent decades. Overall the amount and degree of damage is highly variable from place to place and year to year. Several variables enter into the complex picture of bird damage, including season, local weather, time of harvest, amount of crop production and availability and distribution of wild mast, insects and other foods.

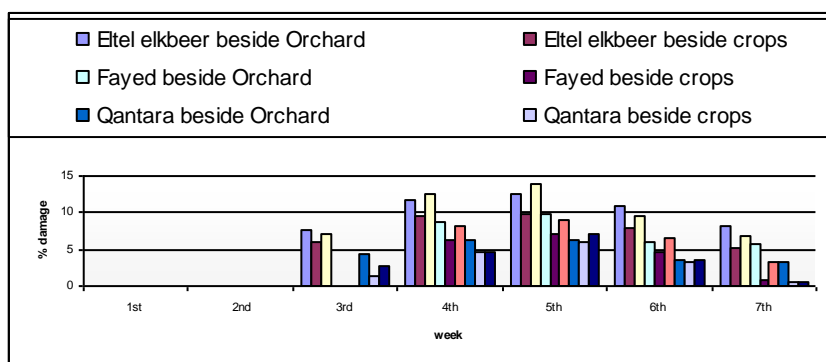
**Bird Damage assessment at wheat:**

One of the principal aspects of the recent national trend for food security in Egypt is to increase the production of wheat crop. The wheat commonly cultivated in Egypt is attacked by wild bird species which represents a Major pest of regular occurrence and cause serious damage under field condition.

Data in table (1) and fig. (1) showed that, high peak losses in wheat were recorded (36.18, 25.78 and 19.24 %) followed by (33.79, 23.3 and 15.52 %) in the 5<sup>th</sup> and 4<sup>th</sup> weeks at El-Tel El-Kbeer, Fayed and El-Qantra respectively, while lowest losses were completely absent during the 1<sup>st</sup> and 2<sup>nd</sup> weeks at all districts.

Regarding the effect of adjacent crop on the losses of wheat caused by wild birds, high damage caused by wild birds recorded during 5th and 4th weeks (28.54, 29.85 and 22.81 %) followed by (26.61, 25.43 and 20.57 %) in orchard, vegetable and field crops respectively, while it completely absent during 1st and 2nd weeks in wheat adjacent all types of crops.

These results agree with EL-Deeb (1991) revealed that the bird damage to ripening stage of wheat reached to 20.68 %, the damage increased gradually during Milky and dough stage then decrease. Khattab (1993) revealed that the highest damage of wheat fields was occurred in fields near by buildings followed by near by orchards, poultry farms while the lowest in near by field crops. Attia (2006) mentioned that birds avoided panicles in early stages until 10 days after emergency and start to attack panicles after 15 days from emergence due to the increase of protein and carbohydrate level. The birds attacking wheat at the second week after anthesis and percent damage increased till the harvest. EL-Danasory (2006) cleared that the damage in wheat crops increased during dough stage and decreased during mature stage, also the highest percentage of damage were in fields near by orchards followed by near by building, near by trees, near by stand crops and near by water canals.



**Fig. (1): Damage appraisal in wheat due to wild bird species at Ismailia Governorate.**

**T1**

**Bird Damage assessment at Maize:**

Maize is one of the preferred food items for hooded crow & house crow. Zea Maize characterized with strong stems and the birds used it as a perches and attack the cubs with the husks and later feed on grains during the developmental stages of the grain (Khattab *et al.*, 2002).

Data in table (2) and fig. (2) revealed that, high losses recorded (20.49, 16.58 and 13.65) followed by (19.63, 14.83 and 13.04) in 6<sup>th</sup> and 5<sup>th</sup> weeks at El-Tel El-Kbeer, El-Qantra and Fayed respectively, while losses absent during the 1<sup>st</sup> week at all districts.

In maize high losses recorded (26.12 and 24.6 followed by 24.34 and 23.16 during 6<sup>th</sup> and 5<sup>th</sup> weeks in fields nearby vegetable and field crops respectively.

These result agree with (Khattab *et al.*, 2002) reported that Hooded crow *Corvus corone sardinus* attack the maturing stage of zea Maize, the preferred time from 35 to 42 days after silking with values 13.21 and 13.90 % in ear without pruning and 19.61, 20.89 % in those with pruning. The percentage of hooded crow *Corvus corone sardinus* damage on Maize was studied by (El-Danasoury, 2006), he reported that the Maize fields of new reclaimed lands exposed severely to hooded crow attacking than the old land at three location, fields near buildings, orchards and trees.

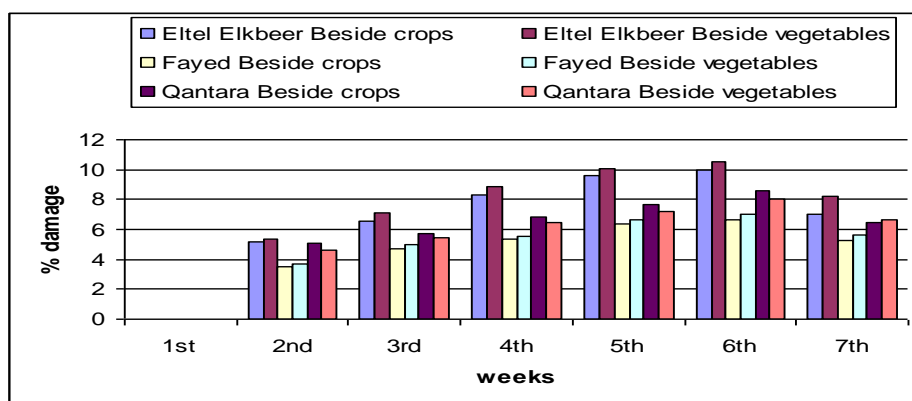


Fig. (2): damage appraisal in Maize due to wild bird species at Ismailia Governorate.

**Bird Damage assessment at tomato:**

Tomato is a nutritive, versatile and perishable fruit. . So its grown world wide and Egypt is one of the top five tomato producers in 2010 according to (Faostat). The tomato may be used as afresh vegetable and as a processed product. It has a high demand both in local and foreign markets.

Birds love tomatoes and are attracted to their color so the ripening tomatoes easily catch the eye of birds and appear easy pickings into their skins.

T2

Data illustrated in table (3) and fig. (3) showed that, damage caused by wild birds recorded (18.63 and 15.35 %) followed by (18.03 and 14.48 %) in the 3rd and 4th weeks at El-Tel El-Kbeer and Fayed districts respectively, while the lowest losses recorded during 7th and 1st weeks it were (9.72 and 10.49 %) (10.11 and 12.76 %) at Fayed and El-Tel El-Kbeer districts respectively.

In tomato losses recorded high peak (19.44 & 14.54 %) followed by (18.78 & 13.73 %) during 3rd and 4th weeks at vegetable & field crops respectively. The lowest losses recorded during 7th and 1st weeks (8.83 & 11 %) followed by (9.69 & 13.56 %) in tomato near by crops & vegetable respectively.

The results agree with (Khattab *et al.*, 2002) revealed that Hooded crow attacks tomato during the maturity stage and caused damage with highest value 10.57 % at the third week from the beginning of the harvest, they also mentioned that the birds attack the red and green fruit, the mean of damage was highly significant, the lowest damage was 3.14 % at red fruit tomatoes at six week and 2.98 % at green tomato. Hassan-Eman (2008) cleared that, hooded crow bird caused damage on tomato at Sharkia, Qalubia and Ismailia Governorate with total value 5%, the highest percentage of damage at Ismailia Governorate followed by Qalubia Governorate and Sharkia Governorate. Baker and Baker (1983) cleared that the sugar composition of nectar and fruit pulps follows consistent patterns, such that plants pollinated by humming birds offer sucrose, dominated nectars where as those pollinated by bats or passerine perching birds offer nectar continuing mainly glucose and fructose.

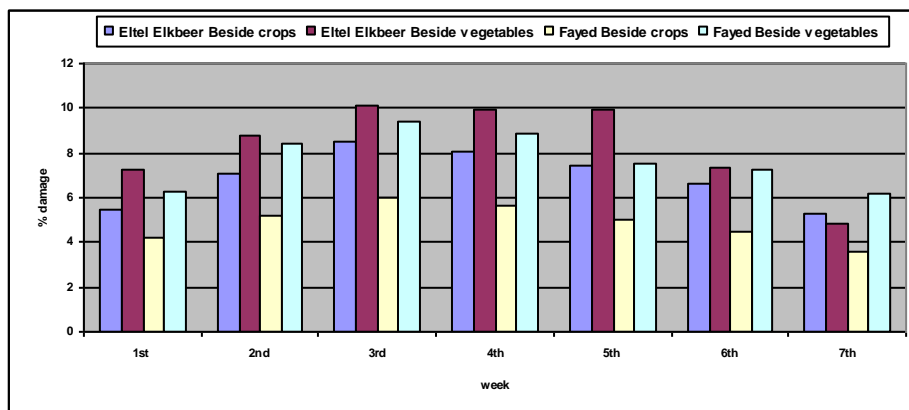


Fig. (3): damage appraisal in tomato due to wild bird species at Ismailia Governorate.



**T3**

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### **خسائر الطيور البرية لبعض محاصيل الحقل تحت الظروف الحقلية لمحافظة الإسماعيلية.**

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تلعب الطيور البرية دوراً هاماً في حياة الإنسان، وتسبب ضرراً كبيراً لكثير من المحاصيل الحقلية تحت ظروف الحقل خلال كل مراحل البذر والنضج. أجريت هذه الدراسة في 3 مناطق بمحافظة الإسماعيلية وذلك بهدف تقييم أضرار الطيور في بعض المحاصيل الحقلية:-

#### **أولاً:- تقييم الخسائر الناجمة عن الطيور في محصول القمح:**

بدأت الطيور البرية تهاجم محصول القمح بعد الأسبوع الثاني من ظهور السنابل. سجل الطور العجيني أعلى نسبة من الضرر ( 9.19 ، 8.58 ، 7.85 %) في الحقول بجانب البساتين ثم الخضر ثم المحاصيل على التوالي، في حين سجلت أدنى ضرر في الطور اللبني.

#### **ثانياً :- تقييم الخسائر الناجمة عن الطيور في محصول الذرة:**

الضرر على حقول الذرة زادت في جميع الأسابيع بعد طور الحرير وخلال تطور ونمو الحبوب حتى الأسبوع السادس، ثم انخفضت في الأسبوع السابع حيث سجلت قيمة ضعيفة ( 8.45 ، 6.52 %) على التوالي، بينما سجلت أدنى قيمة في الطور اللبني مع 4.57%. كما كان هناك فرق كبير جداً بين الأسابيع.

#### **ثالثاً:- تقييم الخسائر الناجمة عن الطيور في محصول الطماطم:**

تهاجم الطيور محصول الطماطم خلال مرحلة النضج مع القيم 8.12 ، 7.36 ، 7.46 ، 6.43 و 4.95% خلال الأسابيع السبعة من بدء النضج والتسويق.

#### **قام بتحكيم البحث**

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**Table ( 1 ): damage appraisal in Wheat due to wild bird species at Ismailia Governorate.**

% damage in wheat																	
Week	Eitel Elkbeer				Fayed				Qantara				Total losses			Total	Mean
	Beside Orchard	Beside crops	Beside vegetables	Total losses	Beside Orchard	Beside crops	Beside vegetables	Total losses	Beside Orchard	Beside crops	Beside vegetables	Total losses	Beside Orchard	Beside crops	Beside vegetables		
1st	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2nd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3rd	7.6	6.07	7.17	20.84	0	0	0	0	4.44	1.39	2.79	8.62	12.04	7.46	9.96	29.46	3.27
4th	11.61	9.56	12.62	33.79	8.81	6.3	8.19	23.3	6.19	4.71	4.62	15.52	26.61	20.57	25.43	72.61	8.07
5th	12.44	9.85	13.89	36.18	9.87	7.02	8.89	25.78	6.23	5.94	7.07	19.24	28.54	22.81	29.85	81.2	9.02
6th	10.96	7.83	9.56	28.35	5.92	4.63	6.52	17.07	3.61	3.28	3.49	10.38	20.49	15.74	19.57	55.8	6.2
7th	8.27	5.14	6.94	20.35	5.68	0.88	3.26	9.82	3.36	0.56	0.62	4.54	17.31	6.58	10.82	34.71	3.85
<b>Total</b>	<b>50.88</b>	<b>38.45</b>	<b>50.18</b>	<b>139.51</b>	<b>30.28</b>	<b>18.83</b>	<b>26.86</b>	<b>75.97</b>	<b>23.83</b>	<b>15.88</b>	<b>18.59</b>	<b>58.3</b>	<b>104.99</b>	<b>73.16</b>	<b>95.63</b>	<b>273.78</b>	<b>30.42</b>
<b>Mean</b>	<b>7.26</b>	<b>5.49</b>	<b>7.17</b>	<b>19.92</b>	<b>4.32</b>	<b>2.69</b>	<b>3.83</b>	<b>10.84</b>	<b>3.4</b>	<b>2.26</b>	<b>2.65</b>	<b>8.31</b>	<b>14.98</b>	<b>10.44</b>	<b>13.65</b>	<b>39.11</b>	<b>4.34</b>

Location	Mean
Eitel Elk beer	4.99 <sup>a</sup>
Fayed	3.48 <sup>a</sup>
El-Qantara	4.55 <sup>a</sup>
LSD 0.05	ns

Week	Mean
1 <sup>st</sup>	0 <sup>d</sup>
2 <sup>nd</sup>	0 <sup>d</sup>
3 <sup>rd</sup>	3.27 <sup>c</sup>
4 <sup>th</sup>	8.06 <sup>ab</sup>
5 <sup>th</sup>	9.02 <sup>a</sup>
6 <sup>th</sup>	6.2 <sup>b</sup>
7 <sup>th</sup>	3.85 <sup>c</sup>
LSD 0.05	2.30 <sup>***</sup>

Stage of maturity	beside orchard	beside crops	beside vegetables
Milk stage	1.33 <sup>b</sup>	0.82 <sup>c</sup>	1.10 <sup>c</sup>
Dough stage	9.19 <sup>a</sup>	7.23 <sup>a</sup>	9.21 <sup>a</sup>
Mature stage	6.30 <sup>a</sup>	3.72 <sup>b</sup>	5.06 <sup>b</sup>
LSD 0.05	3.36 <sup>***</sup>	2.73 <sup>***</sup>	3.61 <sup>***</sup>

Values in a data followed by the same letter are not significantly different (P < 0.05) according to Duncan's multiple –range test.

Table (2): damage appraisal in Maize due to wild bird species at Ismailia Governorate.

% damage in maize														
Week	Eltel Elkbeer			Fayed			Qantara			Total losses		Total	Mean	
	Beside crops	Beside vegetables	Total losses	Beside crops	Beside vegetables	Total losses	Beside crops	Beside vegetables	Total losses	Beside crops	Beside vegetables			
1st	0	0	0	0	0	0	0	0	0	0	0	0	0	
2nd	5.21	5.38	10.59	3.49	3.68	7.17	4.6	5.1	9.7	13.3	14.16	27.46	4.57	
3rd	6.55	7.1	13.65	4.75	5	9.75	5.42	5.74	11.16	16.72	17.84	34.56	5.76	
4th	8.28	8.89	17.17	5.36	5.57	10.93	6.47	6.83	13.3	20.11	21.29	41.4	6.9	
5th	9.59	10.04	19.63	6.37	6.67	13.04	7.2	7.63	14.83	23.16	24.34	47.5	7.92	
6th	9.93	10.56	20.49	6.67	6.98	13.65	8	8.58	16.58	24.6	26.12	50.725	8.45	
7th	6.97	8.17	15.14	5.26	5.63	10.89	6.67	6.47	13.14	18.9	20.27	39.17	6.53	
Total	46.53	50.14	96.67	31.9	33.53	65.43	38.36	40.35	78.71	116.79	124.02	240.81	40.13	
Mean	6.65	7.16	13.81	4.55	4.79	9.34	5.48	5.76	11.24	16.68	17.71	34.4	5.74	
Location											Mean			
Eltel Elk beer											6.90 <sup>a</sup>			
Fayed											4.67 <sup>b</sup>			
El-Qantara											5.62 <sup>ab</sup>			
LSD 0.05											ns			
Week											Mean			
1 <sup>st</sup>											0 <sup>b</sup>			
2 <sup>nd</sup>											4.57 <sup>a</sup>			
3 <sup>rd</sup>											5.76 <sup>ab</sup>			
4 <sup>th</sup>											6.9 <sup>bc</sup>			
5 <sup>th</sup>											7.91 <sup>ab</sup>			
6 <sup>th</sup>											8.45 <sup>a</sup>			
7 <sup>th</sup>											6.52 <sup>c</sup>			
LSD 0.05											1.35 <sup>***</sup>			
Stage of maturity											beside crops		beside vegetables	
Milk stage											3.33 <sup>b</sup>		3.55 <sup>b</sup>	
Dough stage											7.21 <sup>a</sup>		7.60 <sup>a</sup>	
Mature stage											7.25 <sup>a</sup>		7.73 <sup>a</sup>	
LSD 0.05											2.54 <sup>**</sup>		2.73 <sup>**</sup>	

Values in a data followed by the same letter are not significantly different ( P < 0.05 ) according to Duncan's multiple –range test

**Table (3): damage appraisal in Tomato due to wild bird species at Ismailia Governorate.**

Week	% damage in tomato									Total	Mean
	Eltel Elkbeer			Fayed			Total losses				
	Beside crops	Beside vegetables	Total losses	Beside crops	Beside vegetables	Total losses	Beside crops	Beside vegetables			
1st	5.47	7.29	12.76	4.22	6.27	10.49	9.69	13.56	23.25	5.81	
2nd	7.06	8.79	15.85	5.21	8.38	13.59	12.27	17.17	29.44	7.36	
3rd	8.55	10.08	18.63	5.99	9.36	15.35	14.54	19.44	33.98	8.49	
4th	8.1	9.93	18.03	5.63	8.85	14.48	13.73	18.78	32.51	8.12	
5th	7.46	9.92	17.38	4.98	7.48	12.46	12.44	17.4	29.84	7.46	
6th	6.61	7.35	13.96	4.52	7.26	11.78	11.13	14.61	25.74	6.43	
7th	5.25	4.86	10.11	3.58	6.14	9.72	8.83	11	19.83	4.95	
<b>Total</b>	48.5	58.22	106.72	34.13	53.74	87.87	82.63	111.96	194.59	48.65	
<b>Mean</b>	6.93	8.32	15.25	4.87	7.67	12.54	11.8	15.99	27.79	6.95	

Location	Mean
Beside crops	5.90 <sup>b</sup>
Beside Vegetables	7.99 <sup>a</sup>
LSD 0.05	1.19 **

Week	Mean
1 <sup>st</sup>	5.81 <sup>bc</sup>
2 <sup>nd</sup>	7.36 <sup>ab</sup>
3 <sup>rd</sup>	8.49 <sup>a</sup>
4 <sup>th</sup>	8.12 <sup>ab</sup>
5 <sup>th</sup>	7.46 <sup>ab</sup>
6 <sup>th</sup>	6.43 <sup>abc</sup>
7 <sup>th</sup>	4.95 <sup>c</sup>
LSD 0.05	ns

Location	Mean
Eltel Elk beer(beside crops)	6.92 <sup>a</sup>
Eltel Elk beer(beside vegetables)	8.31 <sup>a</sup>
Fayed (beside crops)	4.87 <sup>b</sup>
Fayed (beside vegetables)	7.67 <sup>a</sup>
LSD 0.05	1.51 ***

Values in a data followed by the same letter are not significantly different (P < 0.05) according to Duncan's multiple –range test.