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Effect of different Planting Dates on the Occurrence of Main Predators Inhabiting Five Maize Varieties

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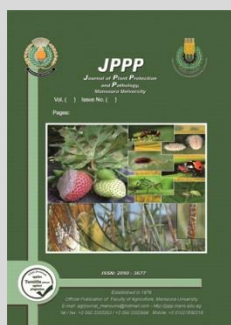
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ABSTRACT

Experiments were carried out in the experimental farm of Dokhmes EL-Mahlla EL-kobra, Gharbia Governorate and another farm of Abosken village, Alhamol, Kafr E-LSheikh Governorate during two successive seasons, 2014 and 2015 to study the effect of planting dates on the main predators inhabiting five different maize varieties. The results showed that the delayed planting dates in August for the different varieties of maize crop had an effect on the presence of the largest number of predators from early planting dates in April and June during the two seasons of investigation 2014 and 2015. The statistical analysis revealed that, highly significant difference in the number of the predators in the planting dates during both seasons. This study recommends that the cultivation date in August of the five different varieties recorded the highest number of predator insects and therefore should not use insecticides in this planting date so as not to destroy the insect predators.

Keywords: Maize Varieties, predators, planting dates, *coccinella undecimpunctata*, *chrysoperla caenea*



INTRODUCTION

Maize, *Zea mays*, L. is one of the most important field crops in Egypt. It is used mainly for human, animal and poultry feeding. Maize (*Zea mays* L.) is the most versatile crop adopted to different agro-climatic conditions. It is an important staple food crop in Asia and Africa. It is the most important crop in the world after wheat and rice. AbdEl-Gayed 1995, Glamočlija, 2004; Glamočlija *et al.* 2015; 2017; Đekić *et al.* 2014; 2015; Terzić *et al.* 2018; Božović *et al.* 2018a; 2018b) Corn plants are usually attacked by several injurious insect pests at different stages of development. Out of them, the pink stem borer, *Sesamia cretica* (Led.) and the European corn borer *Ostrinia nubilalis* (Hb.); which cause great damage and yield losses. It is profitable to adopt an effective and sustainable strategy for controlling these insect-pests. In this concern, sowing dates, planting spaces, foliar fertilizers (macro and micro-nutrients), mineral and/or bio fertilization, were investigated to evaluate their role as tools in the so-called Integrated Pest Management (IPM) program of corn pests. Schepers *et al.* 1991; Abdalla and Blein, (1994); Ahmed, 2000; Metwally, 2002; Villar – Mir *et al.* 2002; Đukić *et al.* 2007; Abozied 2008; Glamočlija *et al.* 2015; 2017). Therefore, this investigation was carried out, to study the influence of planting dates on the main predatory insects inhabiting maize crop.

MATERIALS AND METHODS

The present study was carried out in the experimental farm of Dokhmes village EL-Mahlla EL-

Kobra, Gharbia and another farm of Abosken, ALHamol, Kafr ELSheikh during two successive seasons, 2014 and 2015 on an area of about 1,5 feddan for each season. Influences of some cultural practices i.e, planting dates on the predators inhabiting five different maize varieties. All treatments received the all cultural practices were planted with Single Cross 125, Single Cross 128, Single Cross 168, Single Cross 173, and Tri-Cross 324 Variety).

1- Influence of planting dates on main predators inhabiting five different maize varieties :

Three planting dates were carried out. The first (April plantation) was planted on 23 of April the second (July plantation) was on 15 of July, and the third (August plantation) was on 18 August. Single cross 125, single cross 128, single cross 168, single cross 173 and tri-cross 324 were used in the three planting dates and each date was divided to five replicates. From each corn plantation, 180 plants were sampled two weeks for examination starting three weeks after planting until harvesting in the three dates. Each two weeks random samples of, 36 plants were chosen from each five plots. The main predators surveyed in each date.

2- Statistical analysis

The collected data were subjected to statistical analysis according to Duncan's Multiple Range Test (1955) and the mean values obtained were compared by the Least Significant Differences Test (LSD) \pm Standard Error (\pm SE).

RESULTS AND DISCUSSION

The results obtained cleared that the main predator were recorded *Coccinella undecimpunctata* L., *Cydonia vicina nilotica* Muls., *Cydonia vicina isis*, *Scymnus spp.*,

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Orius albidipennis (Ruet), *Chrysoperla carnea* (Steph.), *Paederus alferii* (Koch.) and *Metasyphus cbrella* (Fab.).

Data presented in Table (1-A) and Fig (1-A) showed that the average numbers of the main predators associated with the corn insect pests in the three planting dates during the season 2014 . the obtained results indicated that, *C. vicina nilotica* were the highest average number (14 , 27 , 30 ,18 and 36 individuals) , *Scymnus spp.* were 12 ,25, 37 ,19 and32 individuals, *O. albidipennis* were(11, 30 ,34 ,22 and 45) , while *C. undecimpunctata* was (10 , 24 , 36 19 and 39 individuals) during the second season, 2014 in August plantation, for single 125,128,168 , 173 and tri-cross 324 individuals ,respectively .

Data arranged in Table (1-A) and illustrated in Figure (1-B) cleared that the average numbers of the main predators associated with the corn insect pests in the three planting dates during season 2014. the obtained results indicated that, *C.carnea* , *M.corella* , *C.vicinaisis* and *P.alferii* were the average number in the two planting dates (june and August) There are no significant differences between them. While the lowest average number for all the tested predators in the single 125 in August planting were 15-11-16 and 17 individuals for , *C.carnea* , *M.corella* , *C.vicinaisis* and *P.alferii* respectively , while in the tri-cross were 41.6-30-37 and 27.67 individuals for , *C.carnea* , *M.corella* , *C.vicinaisis* and *P.alferii* respectively.

Table 1-A. The average number of main insect predators associated with corn insect pests in three planting dates during 2014 season.

Predators	<i>Coccinella undecimpunctata</i>			<i>Scymnus spp</i>			<i>Orius albidipennis</i>			<i>Cydonia vicina nilotuca</i>		
	April	June	August	April	June	August	April	June	August	April	June	August
single ross125	2	2	10	1.33	4	12	3	2.33	11	1.33	5	14
singleross128	7	20	24	9	22	25	5	15	30	5	16	27
single oss168	16	17	36	12	22.6	37	109	16	34	13	14	30.33
single ross173	4	8	19	1.33	9	19	1.67	13	22	1.67	11	18
tri-cross324	16	24.67	39	11	28	32	15	23.33	45	14	23	36
F.test	**	**	**	**	**	**	**	**	**	**	**	**
L.S.D.05	1.12	1.67	10	1.34	1.54	12	1.47	1.75	1.42	1.35	1.63	1.64

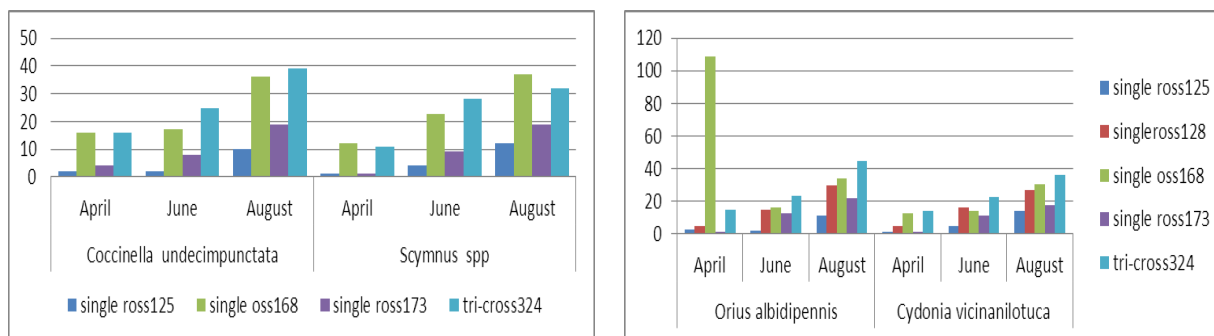


Figure 1-A. The average number of the main insect predators associated with corn insect pests in three planting dates during 2014 season.

Table 1-B. The average number of the main insect predators associated with corn insect pests in three planting dates during 2014 season.

Predators	<i>Chrysoperla carnea</i>			<i>Metasyphus corella</i>			<i>Cydonia vicina isis</i>			<i>Paederus alferii</i>		
	April	June	August	April	June	August	April	June	August	April	June	August
single ross125	2.6	4	15	2	3	11.67	2	1.67	16	1.67	2	17
singleross128	5	16	21.6	7.6	11	34	4	11.67	23	2	5	20
single oss168	4.6	14	36	8	15.6	27	4	13	21	4	11	17.33
single ross173	1.3	11	22	2.3	3	24	2	4	18	1.33	5	19
tri-cross324	13	21	41.6	13.6	15.6	30	9	17	37	9	14	27.67
F.test	**	**	**	**	**	**	**	**	**	**	**	**
L.S.D.05	1.1	1.3	1.7	1.6	1.5	1.78	1.49	1.6	1.6	1.27	1.38	1.8

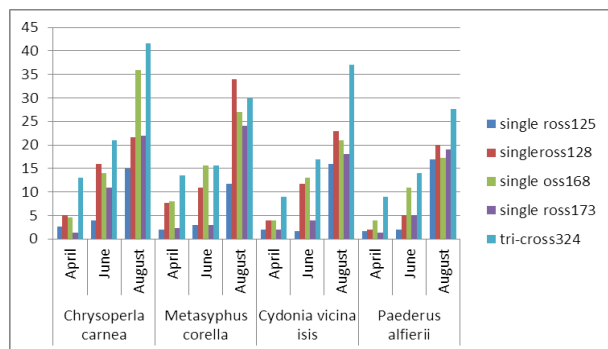


Figure 1-B. The average number of the main insect predators associated with corn insect pests in three planting dates during 2014 season .

The obtained results in Table (2-A) and Figure (2-A) revealed that the average numbers of the main predators associated with the corn insect pests in the two planting dates(June and August) during the season 2015. The obtained results indicated that, the average number of all the tested predators in the two planting dates (June and August) There are no significant differences between them , the results for the single- cross 125 and tri- cross 324 were (11.6 and 11) and (50 and 51 individuals) for *C.undecimpunctata* , *Scymnus spp.* were (11 and 11.3) and (15-14 individuals) , *O.albidipennis* were (15-14) and (55-55 individuals) and *C.vicina nilotuca* were (12-13) and (44-45 individuals) , respectively . In the Table (3-A) and Fig (3-A) cleared that the average numbers of the main predators associated with the corn insect pests in the three

planting dates during the season 2015. Results indicated that, *C.carnea*, *M.corella*, *C.vicina isis* and *P.alfierii* were moderate number in the two planting dates (June and August) There are no significant differences between them. While the lowest average number for all the tested predators in the single 125 in August planting were 15, 16, 11 and 15 individuals for, *C.carnea*, *M.corella*, *C.vicina isis* and *P.alfierii* respectively, while in the tri-cross were 39.3, 53, 38.3 and 27 individuals for, *C.carnea*, *M.corella*, *C.vicina isis* and *P.alfierii* respectively

The obtained results are in agreement with those of Tail *et al.*, (2018) studied predator prey relationship in different maize based planting pattern, the results showed

Predators are present frequently and the presence of aphids decreases in August planting time, Shaito *et al.*, (2012) found of predators, eleven spotted beetle was negatively associated with temperature while, zigzag beetle and eleven spotted beetle were negatively correlated with relative humidity. Populations of rest of the predators were positively correlated with temperature and relative humidity. This study recommends that the cultivation date in August of the five different varieties recorded the highest number of predator insects and therefore should not use insecticides in this planting date so as not to destroy the insect predators.

Table 2-A. The average number of main insect predators associated with corn insect pests in three planting dates during 2015 season.

Predators	<i>Coccinella undecimpunctata</i>			<i>Scymnus spp</i>			<i>Orius albidipennis</i>			<i>Cydonia vicinanilotuca</i>		
	April	June	August	April	June	August	April	June	August	April	June	August
single ross125	20.15	11.6	11	1.33	11	11.33	3	15	14	1.33	12	13
singleross128	1.33	30	31	9	28	28	5.3	27	26	6	20	21.33
single oss168	7	37	36	12	44	44	21.6	44.3	46	12	38	38
single ross173	15	20	21.33	1.33	17	17	2	22	22	3	27	28
tri-cross324	4	50	51	11.67	50	49	14	55	55	14	44	45
F.test	18	**	**	**	**	**	**	**	**	**	**	**
L.S.D.05	**	0.75	11	1.16	1.52	11.33	1.5	1.43	1.5	1.43	1.3	1.1

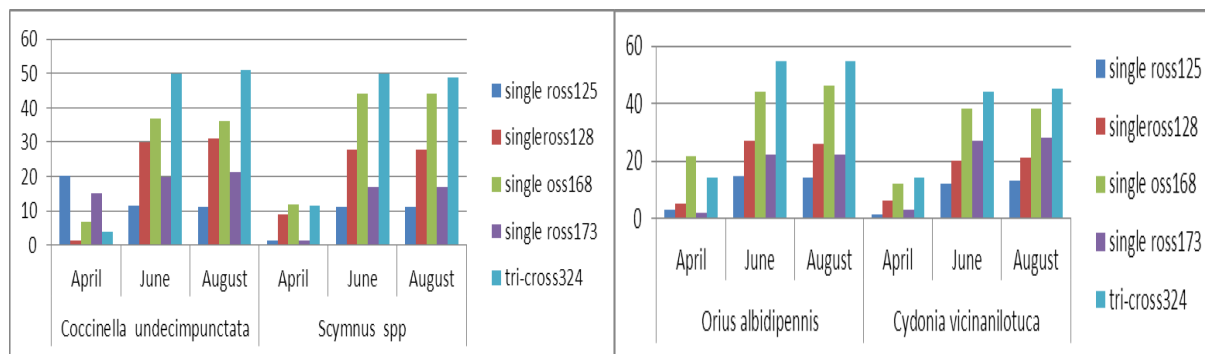


Figure 2-A. The average number of the main insect predators associated with corn insect pests in three planting dates during 2015 season.

Table 2-B. The average number of the main insect predators associated with corn insect pests in three planting dates during 2015 season.

Predators	<i>Chrysoperla carnea</i>			<i>Metasyphus corella</i>			<i>Cydonia vicina isis</i>			<i>Paederus alfierii</i>		
	April	June	August	April	June	August	April	June	August	April	June	August
single ross125	3	15	15	1.6	16	16	1.6	10	11	2	15	15
singleross128	6	30	31	4	31.3	31	3	19	19	6	22	21.3
single oss168	14	28	28	9	26.6	26	6	31.67	32	15	29	28.3
single ross173	2	20	20	3.6	17.6	19	1.3	15	15	19	14	15
tri-cross324	13	39	39.3	3	53	53	11	38.33	38.33	9	27	27
F.test	**	**	**	**	**	**	**	**	**	**	**	**
L.S.D.05	1.38	1.6	1.28	1.38	.70	1.5	1.1	1.27	1.28	.8	1.3	1.38

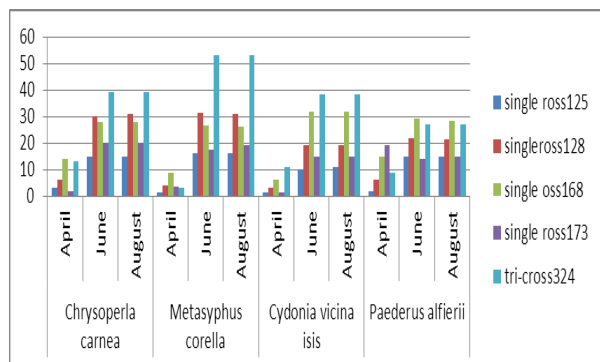


Figure 2-B. The average number of the main insect predators associated with corn insect pests in three planting dates during 2015 season.

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تأثير اختلاف مواعيد الزراعة على تواجد المفترسات الحشرية التي توجد على خمسة سلالات من الذرة
فهيمى الدكتورى عبد الله^١ ، عبد البديع عبد الحميد غانم^٢ ، هالة أحمد كامل الصيرفى^٢ و محمود الدمراوى^١
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أجريت التجارب الحالية في المزرعة التجريبية بقرية لدخمس المحلة الكبرى الغربية ومزرعة أخرى في قرية أبوسكين ، الحامول ، كفر الشيخ خلال موسمين متتاليين ٢٠١٤ و ٢٠١٥ لدراسة تأثير مواعيد الزراعة علي وجود المفترسات علي محصول الذرة . أن مواعيد الزراعة المتأخرة في شهر أغسطس لأصناف المختلفة من محصول الذرة كان لها تأثير على وجود أكبر عدد من المفترسات في مواعيد الزراعة المبكرة (أبريل ويونيو) خلال موسمي الزراعة ٢٠١٤ و ٢٠١٥ . وكشف التحليل الإحصائي أنه يوجد اختلافات معنوية في النتائج المتحصل عليها في عدد المفترسات خلال مواعيد الزراعة في كلا الموسمين. و توصى هذه الدراسة أن ميعاد الزراعة في شهر أغسطس للخمسة أنواع المختلفة سجلت أعلى تعداد للمفترسات الحشرية و لذلك لا يجب استخدام المبيدات الحشرية في هذا الميعاد حتى لا تهلك المفترسات الحشرية .