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Effect of Weeds in Peach Orchards on the Occurrence of Fruit Flies at Gharbia Governorate

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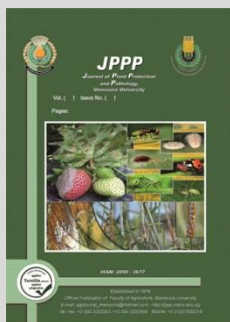


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ABSTRACT

This experiment was carried out in Shobrapeel (El- Santa), Gharbia governorate on peach orchard. From this orchard were chosen four feddans, two were cleaned from different growing weeds during the season and the other two feddans were with weeds. The seasonal population abundance of The Mediterranean fruit fly (MFF) adult males was the highest on peach orchards with weeds 35.6 and 70.3 with an average of 54.0 ± 5.6 indiv./trap/week during the first season (2017). In addition, during the second season (2018), the seasonal population abundance of The Mediterranean fruit fly (MFF) adult males was the highest on peach orchards with weeds 92.8 and 121.0 with an average of 104.7 ± 5.7 indiv./trap/week. The seasonal population abundance of The peach fruit fly (PFF) adult males was the highest on peach orchards with weeds and ranged between 19.2 and 37.8 with an average of 30.6 ± 5.9 indiv./trap/week during the first season 2017. During the second season (2018), the seasonal population abundance of The peach fruit fly (PFF) adult males was the highest on peach orchards with weeds and ranged between 30.7 and 81.2 with an average of 55.8 ± 7.7 indiv./trap/week. Statistical analysis revealed that there was a significant difference between peach orchards with and without weeds during the two seasons according to the means of the insect adult males.

Keywords: Peach orchards, weeds, *Ceratitis capitata*, *Bactrocera zonata*.



INTRODUCTION

In Egypt, fruit crops have a major importance due to high consumption of fresh and processing products as well as fruits can be exported in high value. The total area cultivated with fruits is about 1.34 million feddans and the exported part values about 190 millions US dollars (El-Kassas, 1984). The Mediterranean fruit fly (MFF), *Ceratitis capitata* (Wiedemann) (Diptera:Tephritidae) and the peach fruit fly(PFF), *Bactrocera zonata* (Saunders) (Diptera: Tephritidae) are dominate insect pests of reproductive stages of a wide variety of fruits and vegetables and non-crop hosts in tropical and subtropical countries (Liquido *et al.*, 1991; White and El-Son-Harris (1992) Braham *et al.*, 2007, Anon 2000 a & b and Anon 2003). In Egypt, the two fruit fly species are the most serious insect pests infesting fruit crops causing direct losses in the yield and marketability (Youssef, 2004 and Mosleh

et al., 2011). *Bactrocera zonata* is a highly polyphagous species and can disperse using mosaic of host crops available and take advantage of human agricultural trade. It infests plants of 40 families including many commercial fruits (Syed, 1968 and Vargus *et al.*, 2010).

Therefore, the objective of the present experiment was aimed to study the effect of weeds in peach orchards on the occurrence of fruit flies at Gharbia Governorate.

MATERIALS AND METHODS

This experiment was carried out in Shobrapeel (El-Santa), Gharbia Governorate on peach orchard. From this orchard were chosen four feddans. Two feddans were

cleaned from different growing weeds during the season and the other two feddans were neglected with weeds. All agriculture practices were conducted except the insecticidal treatments were neglected. In each peach feddan two Jackson sticky traps were hanged. One baited with Methyl Eugenol (ME) as male attractant for the peach fruit fly and the other trap baited with Trimedlure (TML) to attract the Mediterranean fruit fly males. The body of Jackson trap is delta shaped made of waxed cardboard material. Inside this body there is a yellow rectangular waxed cardboard covered with thin layer of sticky material called stickum and the traps have a wire hanger placed at the top of the trap body. Traps inspected every week, also sheets and capsule changed weekly. Males were counted and recorded weekly as males/ trap/week (MTW.).

Data analysis:

Data were analyzed with one way analysis of variance. Comparison of means of each treatment were made with Duncan's Multiple Range Test (COSTAT SOFTWARE, 2004).

RESULTS AND DISCUSSION

1. The Mediterranean fruit fly (MFF), *Ceratitis capitata* (Wiedemann).

Data in Fig. (1) showed the seasonal population abundance of MFF adult males in peach orchards with weeds and without weeds during the first season 2017 at Shobrapeel (El-Santa), Gharbia Governorate. It can be noticed that, in the peach orchard with weeds, the seasonal population abundance of MFF adult males ranged between

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27 in the first week of July and 65 indiv./trap/week in the last week of September. Meanwhile, in the peach orchards without weeds, the seasonal population abundance of MFF adult males ranged between 40 in the last week of September and 71 indiv./trap/week in the first week of May.

The obtained data in Fig. (2) showed the seasonal population abundance of MFF adult males in peach orchards with weeds and without weeds during the second season 2018 at Shobrapeel (El-Santa), Gharbia Governorate. It can be noticed that, in the peach orchard with weeds, the seasonal population abundance of MFF adult males ranged between 50 in the third week of July and 169 indiv./trap/week in the second week of June. Meanwhile, in the peach orchards without weeds, the seasonal population abundance of MFF adult males ranged between 34 in the third week of August and 130 indiv./trap/week in the last week of June.

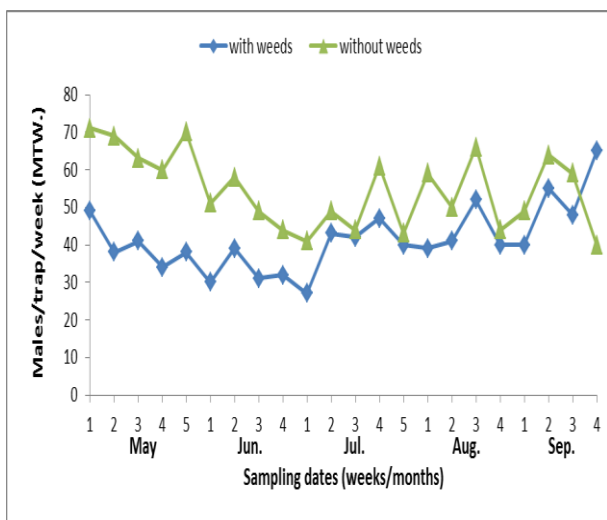


Fig. 1. The seasonal population abundance of MFF, *C. capitata* adult males in peach orchard with and without weeds during season 2017 at Shobrapeel (El-Santa), Gharbia Governorate.

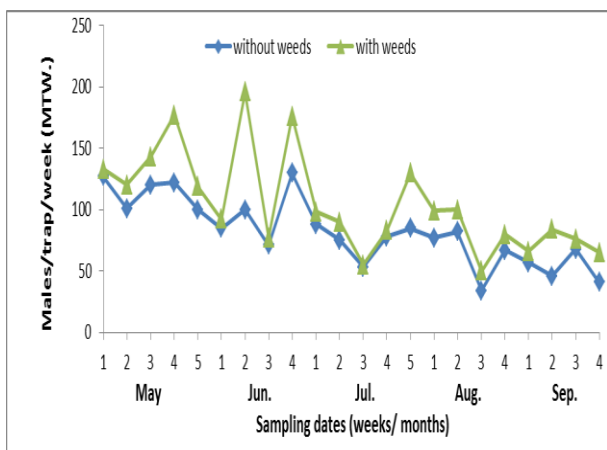


Fig. 2. The seasonal population abundance of MFF, *C. capitata* adult males in peach orchard with and without weeds during season 2018 at Shobrapeel (El-Santa), Gharbia Governorate.

The obtained results in Table (1) showed the effect of weeds on the seasonal population abundance of MFF, *C. capitata* during the two successive seasons, 2017 /18 at Shobrapeel (El-Santa), Gharbia Governorate. The monthly

average number of MFF adult males ranged between 35.6 indiv. /trap/week in July and 70.3 indivi./trap/week in September on peach orchards with weeds, while it was ranged between 32.4 indivi. /trap/ week in May and 55.8 indiv./trap/week in September on peach orchard without weeds during the first season 2017.

Table 1. Effect of the weeds on the seasonal population abundance of MFF, *Ceratitis capitata* (Wiedemann) during the two successive seasons, 2017 and 2018 at Shobrapeel (El-Santa), Gharbia, Governorate.

Months	The first season (2017)		The second season (2018)	
	With weeds	Without weeds	With weeds	Without weeds
May	52.6	32.4	114.6	94.0
Jun.	57.0	34.5	121.0	89.0
Jul.	35.6	38.2	100.4	84.8
Aug.	54.5	43.0	94.8	69.5
Sep.	70.3	55.8	92.8	69.8
Mean± SE	54.0±5.6 a	40.8±4.2 b	104.7±5.7 a	81.4±5.1 b

Means followed by the different letters are significantly different at 5% level of probability.

Moreover, during the second season 2018, the obtained results in Table (1) revealed that, the monthly average number of MFF adult males ranged between 92.8 indivi. /trap/ week in September and 121.0 indiv. /trap/ week in June on peach orchards with weeds, while it was ranged between 69.5 indiv./trap/week in August and 94.0 indivi./trap/week in May on peach orchard without weeds during the second season 2018.

As a conclusion, the obtained data illustrated in Figs. (1 and 2) and Table (1) showed that, the seasonal population abundance of The Mediterranean fruit fly (MFF) adult males was the highest on peach orchards with weeds and ranged between 35.6 and 70.3 with an average of 54.0 ± 5.6 indiv./trap/week during the first season 2017. Also during the second season 2018 the seasonal population abundance of The Mediterranean fruit fly (MFF) adult males on peach orchards with weeds and ranged between 92.8 and 121.0 with an average of 104.7 ± 5.7 indiv./trap/week. Statistical analysis revealed that, there is a significant difference between peach orchards with and without weeds during the two seasons according to the average number of the insect adult males.

These results are in agreement with those of Jang *et al* (2007) who referred to the effect of field sanitation specially removing weeds in suppressing melon fly in Hawaii. He also reported that field sanitation is more effective than other techniques as it suppressed the population density of fruit fly to 7.2%. Also Amin (2017) who found that, the seasonal population abundance of the Mediterranean fruit fly adult males was the highest on peach orchards with weeds.

2. The peach fruit fly (PFF), *Bactrocera zonata* (Saunders)

Data in Fig. (3) showed the seasonal population abundance of PFF adult males in peach orchards with weeds and without weeds during the first season 2017 at Shobrapeel (El-Santa), Gharbia Governorate. It can be noticed that, in the peach orchard with weeds, the seasonal population abundance of PFF adult males ranged between 11 in the last week of July and 55 indiv./trap/week in the

first week of May. Meanwhile, in the peach orchards without weeds, the seasonal population abundance of PFF adult males ranged between 5 in the last week of August and 35 indiv./trap/week in the last week of May.

The obtained data in Fig. (4) showed the seasonal population abundance of PFF adult males in peach orchards with weeds and without weeds during the second season 2018 at Shobrapeel (El-Santa) ,Gharbia Governorate. It can be noticed that, in the peach orchard with weeds, the seasonal population abundance of PFF adult males ranged between 20 in the first week of August and 85 indiv./trap/week in the last week of September. Meanwhile, in the peach orchards without weeds, the seasonal population abundance of PFF adult males ranged between 2 in the first week of August and 67 indiv./trap/week in the first week of May.

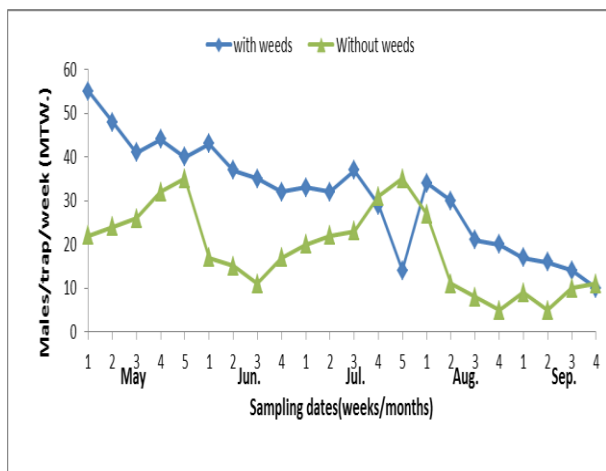


Fig. 3. The seasonal population abundance of PFF, *B. zonata* adult males in peach orchards with and without weeds during season 2017 at Shobrapeel (EL-Santa), Gharbia Governorate.

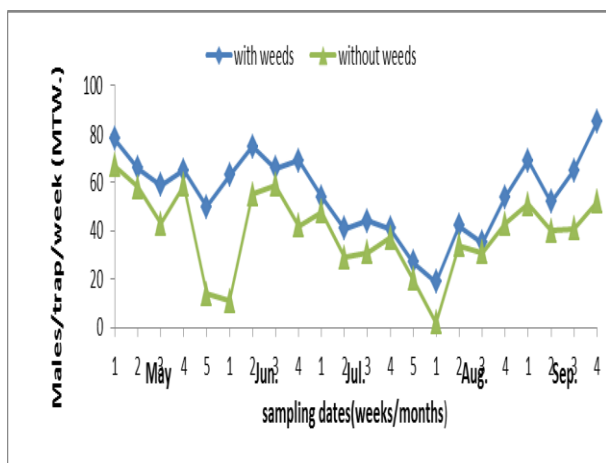


Fig. 4. The seasonal population abundance of PFF, *B. zonata* adult males in peach orchards with and without weeds during season 2018 at Shobrapeel (EL-Santa), Gharbia Governorate.

The obtained results in Table (2) showed the effect of weeds on the seasonal population abundance of the peach fruit fly (PFF), *B. zonata* during the two successive seasons, 2017 and 2018 at Shobrapeel (El-Santa), Gharbia Governorate. The monthly average number of PFF adult males ranged between 19.2 indiv. /trap/week in September

and 38.7 indiv./trap/week in July on peach orchards with weeds, while it was ranged between 10.0 indiv. /trap/ week in September and 22.6 indiv./trap/week in July on peach orchard without weeds during the first season 2017.

Table 2. Effect of the weeds on the seasonal population abundance of PFF, *Bactrocera zonata* (Saunders) during the two successive seasons, 2017 and 2018 at Shobrapeel (El-Santa), Gharbia, Governorate.

Months	The first season (2017)		The second season(2018)	
	With weeds	Without weeds	With weeds	Without weeds
May	37.6	20.8	53.6	45.4
Jun.	38.7	19.5	63.5	34.7
Jul.	32.6	22.6	49.8	37.4
Aug.	24.7	20.2	30.7	21.7
Sep.	19.2	10	81.2	56.7

Mean± SE 30.56±5.9 a 18.62±3.4 b 55.77±8.8 a 39.19±3.5 b

Means followed by the different letters are significantly different at 5%level of probability.

Moreover, during the second season 2018, the obtained results in Table (2) revealed that the monthly average number of PFF adult males ranged between 30.7 indivi. /trap/ week in August and 81.2 indiv./trap/week in September on peach orchards with weeds, while it was ranged between 21.7 indiv./trap/week in August and 56.7 indiv./trap/week in September on peach orchard without weeds during the second season 2018.

As a conclusion, the obtained data illustrated in Figs. (3 and 4)and Table (2) showed that, the seasonal population abundance of the peach fruit fly (PFF), *B. zonata* adult males was the highest on peach orchards with weeds and ranged between 19.2 and 38.7 with an average of 30. 6 ± 5.9 indiv./trap/week during the first season 2017. Also during the second season 2018 the seasonal population abundance of the peach fruit fly (PFF) adult males on peach orchards with weeds and ranged between 30.7 and 81.2 with an average of 55.8±8.8 indiv./trap/week. Statistical analysis revealed that, there is a significant difference between peach orchards with and without weeds during the two seasons according to the average number of the insect adult males.

These results in agreement with those of Jang *et al* (2007) who referred to the effect of field sanitation specially removing weeds in suppressing peach fruit fly in Hawaii. He also reported that field sanitation is more effective than other techniques as it suppressed the population density of fruit fly to 7.2%. Also Amin (2017) who found that, the seasonal population abundance of the peach fruit fly (PFF) adult males was the highest on peach orchards with weeds.

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تأثير الحشائش في حدائق الخوخ علي تواجد ذباب الفاكهة في محافظة الغربية
سمير صالح عوض الله^١ ، عبدالبديع عبدالحميد غانم^١ ، احمد زكي مسلم^٢ و اسماء عاطف نسيم^٢
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اجريت هذه التجربة في شبراويل (السنطة) بمحافظة الغربية في حدائق الخوخ. وقد تم اختيار اربعة افدنة من الخوخ وتم تنظيف فدانان من الحشائش النامية خلال الموسم اما الفدانين الاخرين فقد تركت بالحشائش. كانت الوفرة الموسمية لتعداد لذكور حشرة ذبابة فاكهة حوض البحر الابيض المتوسط اعلي في حدائق الخوخ التي بها حشائش حيث تراوح التعداد بين ٣٥.٦، ٧٠.٣، بمتوسط 50.6 ± 0.0 فرد/مصيبة/اسبوع خلال الموسم الاول ٢٠١٧. ايضا خلال الموسم الثاني ٢٠١٨. كانت الوفرة الموسمية لذكور الحشرة في حدائق الخوخ المحتوية علي حشائش تتراوح بين ٩٢.٨، ١٢١، بمتوسط 104.7 ± 0.7 فردا/مصيبة/اسبوع. وقد اوضح التحليل الاحصائي ان هناك اختلاف معنوي بين حدائق الخوخ التي بها حشائش والخالية من الحشائش خلال الموسمين طبقا لمتوسط تعداد ذكور الحشرة. كانت الوفرة الموسمية لتعداد لذكور حشرة ذبابة الخوخ اعلي في حدائق الخوخ التي بها حشائش حيث تراوح التعداد بين ١٩.٢، ٣٧.٨، بمتوسط 30.56 ± 0.9 فرد/مصيبة/اسبوع خلال الموسم الاول ٢٠١٧. ايضا خلال الموسم الثاني ٢٠١٨. كانت الوفرة الموسمية لذكور الحشرة في حدائق الخوخ المحتوية علي حشائش تتراوح بين ٨١.٢، ٣٠.٧، بمتوسط 50.77 ± 0.8 فردا/مصيبة/اسبوع. اوضح التحليل الاحصائي ان هناك اختلاف معنوي بين مزارع الخوخ التي بها حشائش والخالية من الحشائش خلال الموسمين طبقا لمتوسط تعداد ذكور الحشرة .