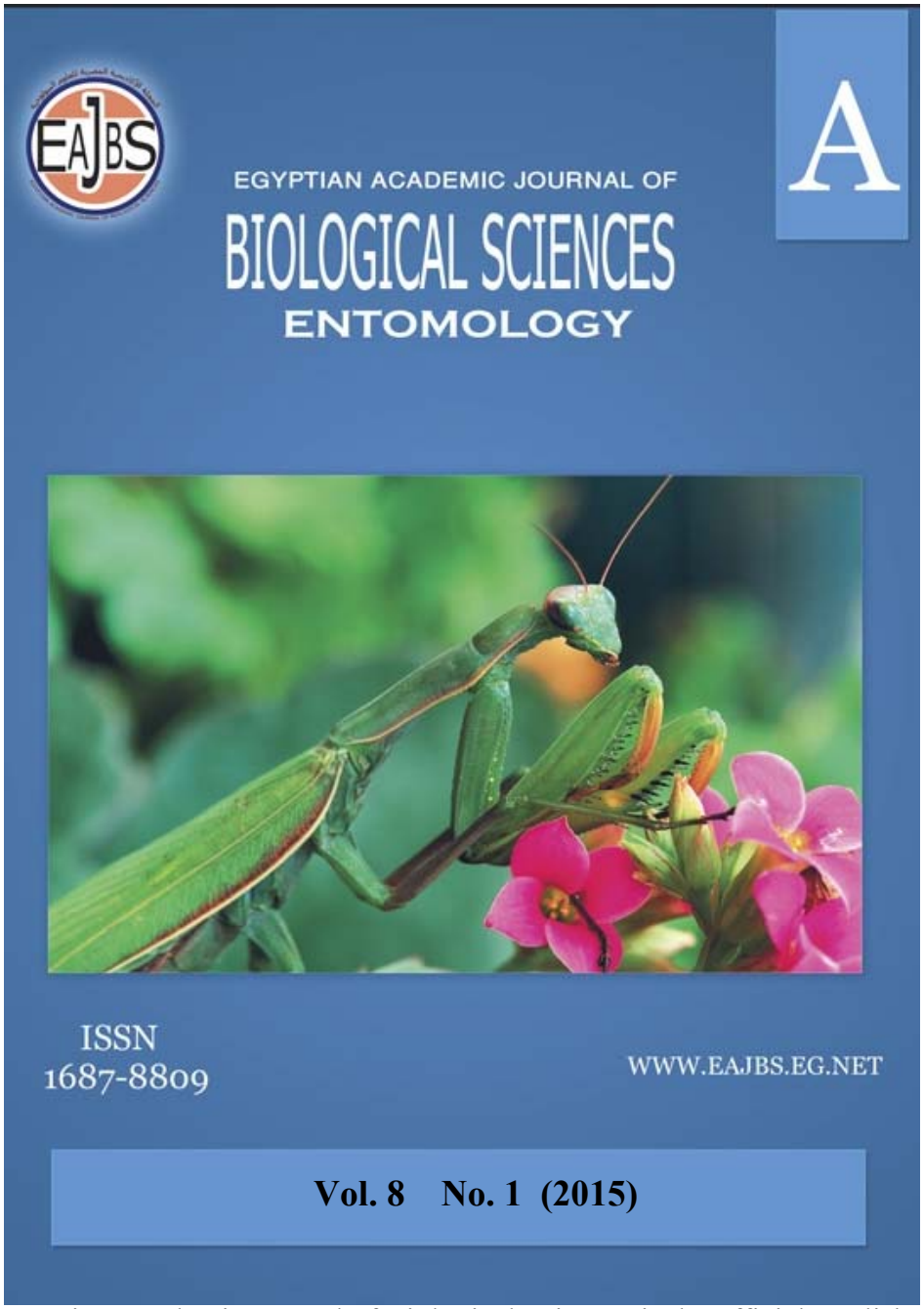

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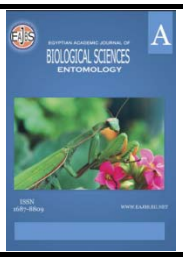

Impact of melon varieties, planting dates and use of sticky traps on suppressing aphid populations on melon plants

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ABSTRACT

Field studies were conducted to determine susceptibility of three melon varieties ;Musk melon, Sharlyne and Ogen melon, to infestation with aphid and effect of planting dates (1st March, 15th March and 1st April) and use of sticky trap at two position and two heights on the suppressing population of melon aphids. The results reveled that the three tested varieties harbored a different levels of aphid infestation during two seasons 2012 and 2013, where Musk melon variety harbored the highest infestation level with aphid for the two tested seasons, followed by Ogen melon, while Sharlyne variety harbored the lowest number of aphid populations. Planting dates appeared highly significant effect on the aphid populations, where earlier planting date (1st March) showed the lowest population of aphids (32.6 and 22.8 individual/ 20 leaves) for two seasons respectively, while the highest population of aphids were recorded on the latest planting date 1st April (88.6 and 76.2 individual / 20 leaves).Yellow sticky traps were tested in vertical and horizontal position and two heights. Trap in position vertical caught more aphids than traps in horizontal position. Significant differences were detected between 30 cm and 40 cm height of the trap above the ground, where the total means number was (67.7 and 41.35 individual/ trap at 30 highest; 40.75 and 26.35 at 40 highest respectively).

INTRODUCTION

The melon (*Cucumis melo*) is a commercially important crop, belonging to family Cucurbitacae. Melons are nutrition food; they rich in potassium and many minerals besides including high water content. Melon contains antioxidant called lycopene which demonstrated its ability to reduce the risk of cancer, it also contains a lot of carotenoids that turn inside the human body to vitamin A, which has a great potential in protecting eye diseases. Melon plants are attacking by many diseases and insect pests during all plant stages (Kerns *et al*. 1995; Anonymous. 1993 and Cuperus and Motes 1987).

The melon aphids *Aphis gossypii* (Glover) (Homoptera: Aphididae) and several other aphid species attack cucurbits, the melon aphid (also known as cotton aphids) is the most abundant and important melon aphid pest in Egypt, it has a wide host rang that can feed on watermelon, cantaloupe, squash, cucumber and pumpkin, cotton and other vegetables are also considered host plants (Kring 1959). The destructive stages (adults and nymphs) are typical aphid with piercing- sucking moth parts. Damage caused by melon aphids includes leaf curling/puckering, wilting, discoloration and stunting. Production of honey dew covers leaves, reducing gas exchange and photosynthesis, various diseases are transmitted by melon aphid lead to plant death. Plant varieties and planting dates are playing an important role in reducing population densities of many pests that attacking the plants. (Mohammed 2012, Aluquerque 1993; Bariwa *et al.* 2005; El- Lakwah *et al*. 2010 and Emam *et al.* 2006).

Sticky traps have been widely used to sample harmful and beneficial insects in wild and cultivated plants worldwide. Traps based on the response of insects to color have been widely used in integrated pest management programs in diverse cultivated crops (Gerling & Horowitz 1984, Hill & Hooper 1984, Chandler 1985, Meyerdirk & Oldfield 1985). Yellow sticky traps are more attractive to aphids (Broadbent 1948, Heatcote, 1957), whiteflies and leafhoppers (Welch & Kondratieff 1993, Mensah 1996, Chancellor et al. 1997), thrips adults (Matteson & Terry 1992, Heinz et al. 1992, Cho et al. 1995, Pearsall 2002), Trap height also is important for mass trapping and monitoring insect populations (Ladd et al. 1984, Chandler 1985, Byrne et al. 1986).

Sticky traps are also considered an important method to control the population densities of insect pests. (Kim and Lim 2011, Idris *et al*. 2012, Rashwan 2004) The objective of this work was to evaluate the effectiveness of varieties, planting dates and sticky traps (heights and position) for controlling melon aphids. This study will improve controlling this pest in crop field and enhance integrated pest management programs.

MATERIALS AND METHODS

Experimental design and locality:

Field experiments were conducted at the experimental greenhouse attached to faculty of Agriculture Ain Shams University, Qalyubia Governorate. The experiments were carried out through two successive seasons (2012 and 2013). The experimental plots were laid out in a randomized complete block design. An area of about 9*54 m^2 was sown with three commercial melon cultivars; Musk melon, Sharlyne and Ogen melon. Each cultivar was grown in three replicates. These three cultivars were sown on three planting dates (1st March, 15th March and 1st April),

To determine the optimal trap position, two positions of yellow sticky traps were maintained (vertical and horizontal). These traps were made of rectangle flat wood and fixed in the ground. Dimensions of sticky cards were 15*30 cm in length and height. Traps were placed at 30 and 40 cm heights above the ground level to determine the efficiency of trap highest on aphid's attraction. The sticky cards were changed weekly. Two replicates were used for both of two heights and two positions. Normal agricultural practices were followed in all treatments the whole area of experiment was kept free from any pesticides applications.

Collecting data:

Weekly samples were started after 15 days of sowing date and continued for 10 weeks. Samples of 20 melon leaves/ replicate were chosen randomly and carefully

examined, all individuals (nymphs and adults) were counted and recorded by using 10X lenses in the field.

Statistical analysis:

Obtained data were analyzed by using SAS institute statistical software (SAS Institute 1988), significant differences between varieties, planting dates and sticky traps (position and highest) were determined by analysis of variance (ANOVA) and based on the least significant differences using General Linear Model procedure (proc GLM).

RESULTS AND DISCUSSION

Effect of melon varieties on the population densities of aphids:

Data in Table (1) and Figure (1) showed the mean numbers of aphid populations on the three tested melon varieties; According to the mean number of aphids, Sharlyne variety showed the lowest attraction of aphids with mean number (28.3 and 11.2/ 20 leaves) for the two tested seasons 2012 and 2013, followed by Ogen melon variety (36.5 and 28.2/20 leaves) for the two seasons respectively, while the highest population was recorded on Musk melon through the two successive seasons 20120and 2013, where the mean number of aphid (138.2 and 103.2/20 leaves) respectively. Statistical analysis of data revealed highly significant differences between mean numbers of aphid populations on the three tested varieties during two successive seasons (2012 and 2013), where F value = 182.9 and 452.3 respectively. These results were agreed with Karavina *et al.* (2012), who found that the population densities of aphids are varied according to varieties. Also, these results are in harmony with those recorded by Whitney (1999) and Griffen (2010) who indicated that aphids are considered to be very serious minor pest that attack cucurbits, particularly melons and cucumbers. Hafiz et al. (1997) proved that cucumber varieties had significant effect on aphid development and reproduction

Table 1: Mean number of aphid recorded on three melon varieties sown on three dates through two successive seasons 2012 and 2013 at Qalyubiya Governorate.

Season	Mean number of aphid populations on three melon varieties			L.S.D	Mean number of aphid populations at three planting dates			L.S.D
	Musk melon	Sharlyne	Ogen melon		1st March	15th March	1st April	
2012	138.2[a]	28.3[c]	36.5[b]	5.12	32.6[c]	56.3[b]	88.6[a]	2.75
2013	103.5[a]	11.2[c]	28.2[b]	2.66	22.8[c]	43[b]	76.2[a]	4.6

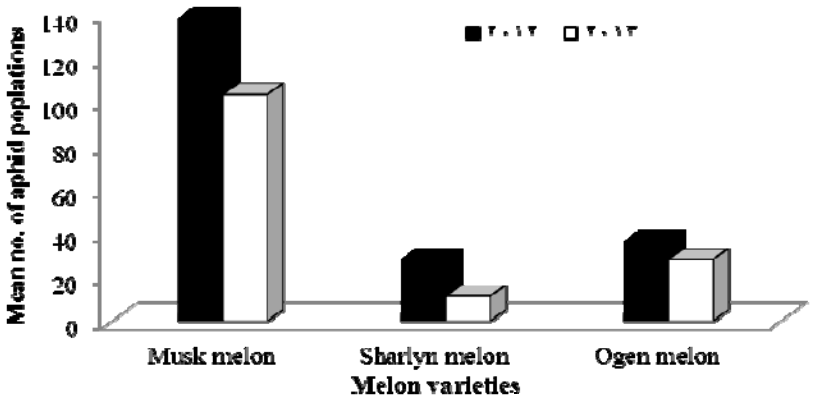

Fig. 1: Mean number of aphids recorded on three melon varieties through two successive seasons, 2012 and 2013 at Qalyubiya Governorate.

Effect of planting dates on the population densities of melon aphids:

As shown in Table (1) and Figure (2), the population densities of aphids increased as planting date was delayed through two seasons. The melon plants that sown in the earliest planting date (March, 1st) received the lowest mean number of aphids (32.6 and 22.8/ individual/20 leaves) for the two seasons respectively. Aphids population increased gradually during the second planting date for the two tested seasons (56.3 and 43/ 20 leaves) respectively. On the contrary, the plants of the last planting date (April 1st) harbored highest numbers of aphids (88.6 and 76.2 individuals/20 leaf. Data analysis revealed significant effect of planting dates on the aphid populations through the two successive seasons 2012 and 2013, where F value =132.9 and 446.7 respectively. These results are similar to data obtained by Habashi *et al*. (2007), in which the population of aphids on cucumber observed in mid April in few numbers and increased to reach its peak in the third week of May. Helmi and Rashwan (2013) cited that potential for aphid infestation can be reduced by early sown on wheat plants. Mohamed (2012) found that The squash plants were sown in the earliest planting date (March, 15th) infested significantly by the lowest mean number of *A. gossypii* , while, the plants of the last planting date (May, 1st) recorded highest numbers. Also these results were agreed with Emam (2006); Helaly *et al*. (1990); Salman and Abou- Elhagag (2001); Metwally *et al*. (1994).

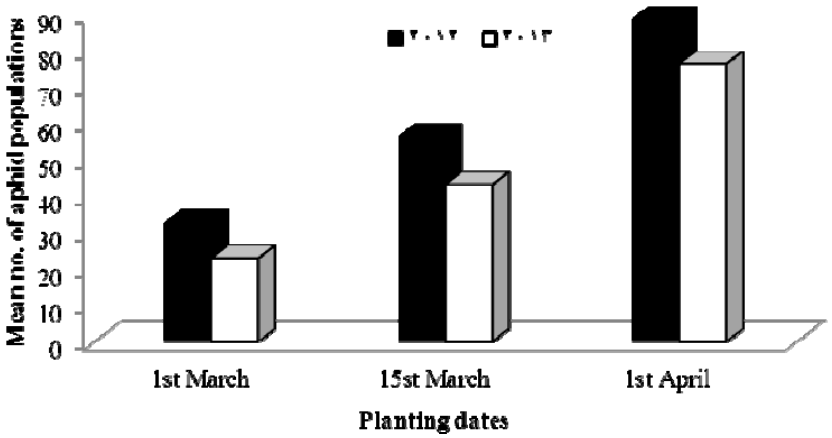

Fig. 2: Mean number of aphids recorded on melon plants sown at three dates through 2012 and 2013 seasons at Qalyubiya Governorate.

Effect of yellow sticky traps on the captured numbers of melon aphids:

a- Effect of trap position:

The collected data from the field experiments were represented in Table (2) and Figure (3), data revealed that the captured numbers of melon aphid was greatly affected by trap position. Trap in vertical position caught a higher number of aphids (67.7 and 40.75 individual/ trap) as compared to traps in horizontal position (41.35 and 26.35 individual/ trap) at the two heights 30 and 40 cm respectively.

These results were supported with statistical analysis, where it shows highly significant differences between two directions, where F value = 109.5 and 234.3 respectively. These results are agreed with (Gencsoylu 2007; Roa *et al*. 1991: Gerling and Horowitz 1984).

Table 2: Mean number of melon aphids caught on sticky traps placed at two positions and two heights through 2012 and 2013 seasons at Qalyubiya Governorate.

Trap height	Mean number of aphids caught on sticky traps						
	2012		2013		Mean no. of population		L.S.D.
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	
30 cm	72^{a}	43.5^{a}	63.4^{a}	39.2^{a}	67.7^{aA}	41.35^{aB}	2.26
40 cm	42.3^{b}	29.3^{b}	39.2^{b}	23.4^{b}	40.75^{bA}	26.35^{bB}	4.7
L.S.D.	2.93	4.52	4.3	2.44	3.65	5.26	-

Means followed by the different small letter in each column and capital letter in each rows are significantly different at 0.05 level of probability.

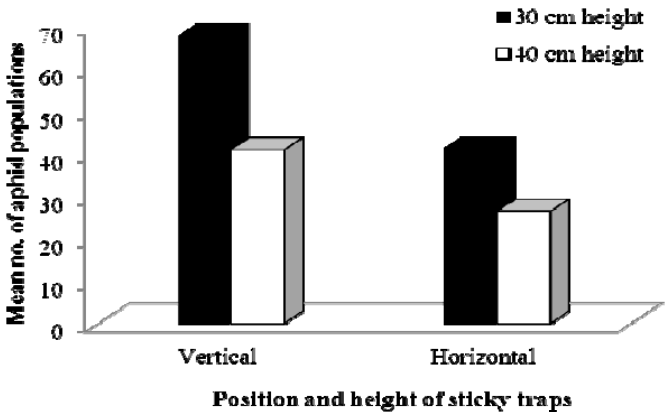

Fig. 3: Mean number of melon aphids caught in sticky traps placed at two heights and two positions through 2012 and 2013 seasons at Qalyubiya Governorate**.**

b- Effect of trap heights:

The effect of trap heights on captured aphid numbers is also presented in Table (2) and Figure (3). Represented data indicated that the total mean number of aphids for two years was higher at 30 cm height (67.7 and 41.35 individual) at vertical and horizontal position compared to (40.75 and 26.35 individuals) at 40 cm height for vertical and horizontal position. Significant differences were appeared between the two tested heights of trap (30 and 40 cm), where F value =739.2and 45.3 through the two seasons respectively. These results were agreement with those obtained by Gerling and Horowitz 1985; Atakan and Canhilal 2004; Broadbent 1948, Heatcote, 1957. (Gencsoylu 2007) reported that the highest of sticky trap affect the captured population of *Bemisia tabaci* , *Aphis gossypii* and *Empoasca* spp. on the cotton plants.

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ARABIC SUMMERY

تأثير أصناف الكانتالوب ومواعيد الزراعة واستخدام المصائد اللاصقة على خفض مجاميع حشرات المن على نبات الكانتالوب

رانيا صلاح رشوان

قسم وقاية النبات - كلية الزراعة - جامعة عين شمس - مصر

قسم الأحياء - كلية العلوم - جامعة الطائف – المملكة العربية السعودية

اجريت الدراسات الحقلية لتحديد حساسية الاصابة بحشرات المن لأنواع الكانتالوب الثلاثة (ماسك و شارلين واوجين)، ودراسة تأثير ثلاثة مواعيد زراعه (اول مارس ومنتصف مارس واول ابريل) ، كذلك دراسة تاثير المصائد اللاصقة من حيث ارتفاع ووضع المصيده في خفض مجاميع المن. واشارت النتائج الى ان هناك مستويات مختلفة من الاصابة بحشرات المن على الاصناف الثلاثة خلال الموسمن 2012 و 2013، حيث كان الصنف ماسك هو اكثر الانواع اصابة بحشرات المن خلال الموسمين ، يليه الصنف اوجين بينما الصنف شارلين كان اقل اصابة بحشرات المن. وقد اظهرت مواعيد الزراعه معنوية عالية في التأثير على تعداد حشرات المن. و مثل ميعاد الزراعه المبكر في أول مارس اقل تعداد لحشرات المن (32.6 و 22.8 فرد/ 20 ورقة) خلال الموسمين على التوالي. بينما سجل اعلى تعداد لحشرات المن في ميعاد الزراعه المتأخر اول ابريل (88.6 و 76.2 /20 ورقة نبات) لعام 2012 و2013. كما تم اختبار المصائد في الوضع الافقي والرأسي وكذلك اختبار تأثير ارتفاعان للمصيدة على جذب الحشرات. ووجد ان المصائد في الوضع الرأسي جذبت تعداد اكثر من الحشرات عن الوضع الأفقي. كما وجدت فروقا معنوية في جذب الحشرات بين الارتفاعين 30 سم و40 سم. حيث كان متوسط التعداد الكلي 76.7 و 41.35/فرد للمصيده عند الرتفاع 30 سم ومتوسط التعداد الكلي 40.75 و 26.35 عند الارتفاع 40 سم للوضع الرأسي والافقي على التوالي.