

**PLANTING DATE IN RELATION TO  
*CASSIDA VITTATA* VILL. (COLEOPTERA: CHRYSOMELIDAE)  
 INFESTATION AND YIELD COMPONENTS IN SUGAR BEET FIELDS**

**EL-SERWY, S. A.**

*Plant Protection Research Institute, ARC, Dokki, Giza*

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***Abstract***

The tortoise beetle, *Cassida vittata* Vill., (Coleoptera: Chrysomelidae) is a serious pest on sugar beet causes losses in root yield and sugar content in Egypt. In this work, five field free of pesticides planted (with Raspoly sugar beet variety) at five different dates through August to October 2005 were chosen at Shirbin, Dakahlyia governorate, in 2005- 2006 season. In each field, yield components and level & intensity of infestation were determined. These findings were greatly varied according to sowing date, sugar beet planted during the first half of August had a low yield (18.6 tons / fed.) with 19.5% sugar content. The yield increased progressively with delaying the date to reach 29.8 tons/fed. with 18.1% sugar content for October 1 plantation. The late plantation of October 20 harbored a light yield (19.6 tons /fed.) with the lowest sugar content (17.9%). The infestation firstly appeared in a low level of 10% infested leaves and 7.6 pores / 4 leaf discs on September, reached 100% and 45.2 pores in the last plantation. Also, the estimated highest average of income loss was found in the late plantations as about 1493 L. E. / feddan (about 32.5%) when compared with the free infested early plantations during August. On the other hand, the plantations of September 15 and October 1 received light infestation and low pores recognized the highest income. Therefore, early planting during August and September, could be followed for sugar beet crop as one of the best agricultural control method

**INTRODUCTION**

Sugar beet, *Beta vulgaris* L., is the second sugar crop in Egypt. This crop faces several problems that reduce its yield, of which the tortoise beetle, *Cassida vittata* Vill.. Few studies pertaining to the effect of planting dates on the infestation by this pest (Awadalla *et al*, 1992 Salama & Elnagar, 1992, and Aly *et al*, 1993). Several authors contributed to damage caused by larvae and adults of *C. vittata*, losses in root yield and economic threshold level on sugar beet plants, Metwally *et al*, 1987, Mostafa *et al*, 1992, Ebieda *et al*, 1996, Ebieda 1997 and Bassyouny, 1998 in Egypt and Nadif, 2007 in Morocco. The present study initiated to study the effect of five

planting dates on level and intensity of infestation by this beetle and losses in yield components and return at Shirbin region in Dakahlyia governorate during 2005- 2006 sugar beet growing season.

## MATERIALS AND METHODS

Five fields, owned to farmers, ranged from 800 to 4200 m<sup>2</sup>, planted with Raspoly sugar beet variety were chosen at Shirbin, Dakahlyia governorate, 2005-2006 season. These fields were planted on August, 10 and 28, September, 15 and October 1, and 20 and not received any insecticidal application till harvest. To obtain level of infestation and feeding pores density, thirty leaves were collected randomly from each field on the day before harvest and transferred directly to the laboratory. All leaves in each date were separately classed as pored (infested) or non pored (not infested). Four discs (2 x 2 cm, each) were randomly selected and cut off from each infested leaf to record number of feeding pores in each.

Data concerning root yield and sugar % content as well as price per ton and income as L.E. per feddan (= 4200 m<sup>2</sup>) for each field were obtained from the administration of the sugar factory at Abou Madi.

## RESULTS AND DISCUSSION

Data in Table (1) show that, the sugar beet fields were harvested after the recommended period (180- 210 days of plant age).

The root yield and percentage of sugar content as well as infestation level and density of feeding pores were greatly varied according to sowing date. Sugar beet planted during the first half of August had a lower yield (18.6 tons / fed.) with 19.5% sugar content (Table 1). The yield increased progressively to 19.9, 26.0 and 29.8 tons/fed. in the fields planted on August 28, September 15 and October 1, respectively, but lowered to 19.6 tons/fed. in the field planted on October 20. Sugar content averaged 20.7 and 19.5% in case of August 28 and September plantations, but decreased to 18.1 and 17.9% in October plantations. The infestation started in a low level as 10% infested leaves and 7.6 pores / 4 leaf discs on September, 15 plantation (Table 1). These findings increased to 12 and 100% and 12.8 and 45.2 pores in the last two plantations, respectively.

As for the economic view, the early plantation, during the first half of August, achieved the highest price (260 L.E. / ton) and a reasonable return 4836 L.E. / feddan. The price decreased to 230, 200, 167 and 164/ton in the followed four plantations, respectively.

Data in the same Table revealed that, September 15 and October 1 represented the best dates for planting the sugar beet. *C. vittata* could be minimized infestation to 10 & 12% infested leaves and 7.6 & 12.8 pores/ 4 leaf discs and, in the same time, recognized the highest income (4977 and 5200 L. E. / feddan). Ebieda (1997) reported that, the tortoise beetle affected to a great extent the leaves of sugar beet plants, whereas the roots and sugar beet yields were less affected which may be due to the compensation character of sugar beet plants. The late plantation (on October 20) received the sever infestation, all leaves were infested, with 45.2 pores/4 leaf discs. Also, a light yield with the lowest sugar content (17.9%) was gained. So, the least income was achieved in this plantation as 3214 L. E./ only. The estimated average of income loss was about 1493 L. E. / feddan (about 32.5%) when compared with the free plantations.

In conclusion, sugar beet yield components were greatly varied by delaying sowing date as well as the level and intensity of infestation by *C. vittata*. Early plantations during August escaped from infestation had lower yield and highest sugar content, achieved the highest price per ton and reasonable return per feddan. On contrary, late plantation on October 20 inhabit sever infestation either in level or density of feeding pores, had lower yield and lowest sugar content, harbored the lowest price per ton and return per feddan. However, September and early October plantations inhabit low level and feeding pores density achieved the highest yield and return. Therefore, early planting during August and September, could be recommended for sugar beet crop to avoid the side effect of insecticides and conserve and promote natural enemies as one of the best agricultural control method. This result coincides with the findings of Salama & El-Nagar, 1992 and Aly *et al*, 1993.

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Table 1. Effect of different sowing dates on sugar beet yield components, level and intensity of infestation by *C. vittata* and financial income at Shirbin during 2005- 2006 sugar beet growing season.

Sowing date		Plant age* (day)	Infested leaves (%)	Pores/ 4 leaf discs	Roots (ton /fed.)	Sugar content (%)	Price / ton (L. E. )	Income/ fed (L.E.)
Month	Day							
August	10	180	0	0.0	18.6	19.5	260	4836
	28	207	0	0.0	19.9	20.7	230	4577
September	15	200	10	7.6	26.0	19.5	200	5200
October	1	202	12	12.8	29.8	18.1	167	4977
	20	187	100	45.2	19.6	17.9	164	3214

\* At harvest

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## علاقة موعد الزراعة بالإصابة بخنفساء البنجر السلحفاية ومكونات المحصول في حقول بنجر السكر.

سمير عوض السروي

معهد بحوث وقاية النباتات-مركز البحوث الزراعية- دقى - جيزة

تعتبر خنفساء البنجر السلحفاية من رتبة غمدية الأجنحة وفصيلة كرايسوميدي آفة خطيرة تحدث خسائر في حقول بنجر السكر من حيث محصول الجذور ونسبة السكر في مصر. أختير خمسة حقول غير معاملة بالمبيدات زرعت ببنجر السكر صنف راسبولى في خمسة مواعيد مختلفة خلال أغسطس - أكتوبر ٢٠٠٥ في شربين محافظة الدقهلية موسم ٢٠٠٥-٢٠٠٦. تم تقدير مكونات المحصول ومستوى إصابة الأوراق وكثافة الثقوب بها في كل حقل. تشير النتائج إلى أنها تختلف بشدة تبعا لمواعيد الزراعة: فالحقول المنزرعة خلال النصف الأول من أغسطس أعطت محصول منخفض (١٨,٦ طن للقدان) ونسبة سكر ١٩,٥%. ازداد المحصول باطراد بتأخير موعد الزراعة إلى ٢٩,٨ طن للقدان ونسبة سكر ١٨,١% في الحقل المنزرع في أول أكتوبر. أما الزراعة المتأخرة في ٢٠ أكتوبر فأنتجت محصولا منخفضا (١٩,٦ طن للقدان) وأقل نسبة سكر (١٧,٩%). أوضحت النتائج كذلك أن الإصابة بالحشرة قد بدأت بمعدل منخفض ١٠% للأوراق و ٧,٦% ثقوب / ٤ قرص ورقى في سبتمبر ازدادت إلى ١٠٠% و ٤٥,٢% ثقوب تغذية/ ٤ قرص في نباتات آخر ميعاد للزراعة. قدر معدل الفقد في الدخل في الزراعة المتأخرة بحوالى ١٤٩٣ جنية / فدان (حوالى ٣٢,٥%) مقارنة بالنباتات المنزرعة مبكرا خلال أغسطس والخالية من الإصابة. أما النباتات المنزرعة في ١٥ سبتمبر و ١ أكتوبر فكانت إصابتها خفيفة وثقوبها أقل وحققت أعلا عائد. بهذا ينصح بالزراعة المبكرة خلال أغسطس وسبتمبر كأحدي طرق المكافحة الزراعية لخنفساء البنجر السلحفاية في حقول بنجر السكر.