Zagazig J.Agric. Res., Vol. 29 No.(6) 2002 *2099-2107*

SEASONAL ABUNDANCE OF CERTAIN SUCKING PESTS OF SOYBEAN IN DIFFERENT SOWING DATES.

Louise S. Sourial; M.F. Girgis; F.K. El-Duweini and Samira M. Henien
Plant Protection Research Institute, Agric. Res. Center, Dokki-Egypt.

Received 10 / 7 / 2002 *Accepted 2 / 11 / 2002*

ABSTRACT: Field experiments were conducted in two locations at El-Minia Governorate to determine the effect of sowing date of soybean on infestation with three piercing and sucking pests (aphid, *Aphis gossypii* Glov., whitefly, *Bemisia tabaci* Genn. and spider mite, *Tetranychus arabicus* Attiah).

Applied sowing dates were 20th of May 2nd and 10th of June in the two locations. The mean total numbers of aphid/ plant in the two locations were low in the 20th of May compared with the two other planting dates. Meanwhile, whitefly level of infestation was also significantly low in the same sowing date. On the other hand, the recommended date for sowing soybean to avoid severe infestation with mites was the 10th of June.

Key Words: Soybean, sowing date, *Aphis gossypii*, *Bemisia tabaci*, *Tetranychus arabicus*.

INTRODUCTION

Soybean is one of the important leguminous crops in Egypt. It is subjected to attack by several piercing and sucking pests that cause severe damage in the field

(El- Kifl *et al.*, 1974; Shaheen, 1977 and El- Khouly *et al.*, 1998).

Sowing date proved to be of great effect on the population density of piercing and sucking pests and subsequently on the infestation levels, which could be used in an effective manner through IPM programs to avoid high populations and severe infestation levels of key pests. The role of sowing date on many crops has been reported by several investigators (Ezueh and Taylor, 1984; El Sayed *et al.*, 1998; Marzouk and El-Bawab, 1999; Metwally, 1999; El-Saadany *et al.*, 2000). The goal of the present work is to give knowledge that may help planning a successful IPM program for piercing and sucking pests infesting soybean fields through selection of the most appropriate date of sowing in two locations in Middle Egypt.

MATERIALS AND METHODS

The present work was conducted in season 1998 in two locations in El-Minia, one in the most northern part (El Edwa, El Fashn in El-Minia Governorate) and the other in the most southern part (Dermoas, Dirout in Assuit Governorate). In each location, an area of about one and half feddans were divided into three plots each devoted for one sowing date. The three sowing dates were 20th of May, 2nd and 10th of June. Usual agricultural practices were applied and no insecticides were used. Weekly samples of 40 leaves were randomly picked-up from each treatment and examined for infestation with aphid, *Aphis gossypii* Glov., whitefly, *Bemisia tabaci* Genn. and spider mite, *Tetranychus arabicus* Attiah from mid June until the end of the season of soybean crop. The relationship between the populations of the three considered sucking pests and the sowing dates applied was compared in the two experimental locations.

RESULTS AND DISCUSSION

The role of three planting dates and the corresponding level of infestation with aphids, whiteflies and spider mites were studied in two locations in El-Minia and Assuit. Data in Table (1) show the mean infestation level at the end of the season in the three sowing dates 20th of May, 2nd and 10th of June for the three tested sucking

pests. Seasonal fluctuation of the considered pests was illustrated in Figures 1-6.

1. Effect of sowing date on aphid, *A. gossypii* abundance:

Figures (1) and (2) represent the total seasonal fluctuations of aphid population through the season in the three different sowing dates 20th of May, 2nd and 10th of June in the two locations (El Edwa, El Fashn and Dermoas, Dirout).

The number of aphids appeared in relatively low numbers in the beginning of the season and increased giving the highest peak on the 14th of August in the three sowing dates.

Results emphasized that planting date of soybean affected the rate of infestation with aphids in both locations. Although the peak of infestation in the 3rd sowing date was higher than in the 1st and 2nd, the mean level of infestation at the end of the season was almost the same in the 2nd and 3rd (27.83 and 27.20 aphids/ soybean leaflet, respectively) sowing date while it was significantly lower in the 1st date (16.27 aphids/ soybean leaflet) as shown in Table (1).

2. Effect of sowing date on whitefly, *B.tabaci* abundance:

Effect of sowing date on the population of whitefly is shown in Figures (3) and (4) in the two mentioned locations, respectively. In the 1st sowing date, the whitefly infestation occurred at the end of June and reached the peak in the end of July in both locations. Meanwhile, infestation started two weeks later, but was higher in the 2nd sowing date revealing two peaks in late July and in mid August. However, in the 3rd sowing date, infestation with whitefly began in the end of July reaching its peak in the end of August in the two locations. From Table 1 the mean infestation level with whitefly was significantly lower in the 1st sowing date (63.40 insects / soybean leaflet) compared with the 2nd and 3rd sowing dates (126.07 and 124.67 insects / soybean leaflet, respectively). Such results suggest that it is recommended to sow soybean in 20th of May to avoid high whitefly infestation.

This result is in agreement with the findings of Shaheen (1977) who reported that the late plantations of soybean were much more susceptible to infestation

with whiteflies, bean flies and the cotton leaf worms and that the rate of infestation corresponded positively with the date of planting.

3. Effect of sowing date on spider mites, *T. arabicus* abundance:

Maximum infestation level with mites was recorded in the first sowing date reaching its peak in the end of July in the two locations (Figures 5 and 6). In the 2nd sowing date, infestation was significantly lower and began to increase by the end of June reaching its peak in the beginning of August in the two mentioned locations. On the other hand, minimum infestation level was recorded in the 3rd sowing date, in the two locations.

Table (1) also shows that the total mean infestation level of spider mites is significantly lower in the 3rd sowing date (8.83 mites /40 inch) compared with the infestation in the 1st and 2nd sowing dates (551.07 and 149.00 mites /40 inch, respectively). Statistical analysis revealed highly significant differences in mite population in the three tested plantation dates in both locations. Generally the above mentioned data lead to the conclusion that sowing soybean should take place in 10th of June to avoid as much as possible mite attack.

Table (1): Average numbers of soybean pests in different sowing dates

Pest	Sowing date	1st location	2nd location
Aphid (*A. gossypii*)	20th May	16.27	13.00
	2nd June	27.83	21.86
	10th June	27.20	17.57
	L.S.D.	13.00	6.34
Whitefly (*B. tabaci*)	20th May	63.40	55.40
	2nd June	126.07	92.67
	10th June	124.67	96.33
	L.S.D.	57.24	44.88
Spider mite (*T. arabicus*)	20th May	551.07	561.67
	2nd June	149.00	101.60
	10th June	8.83	4.60
	L.S.D.	208.33	233.41

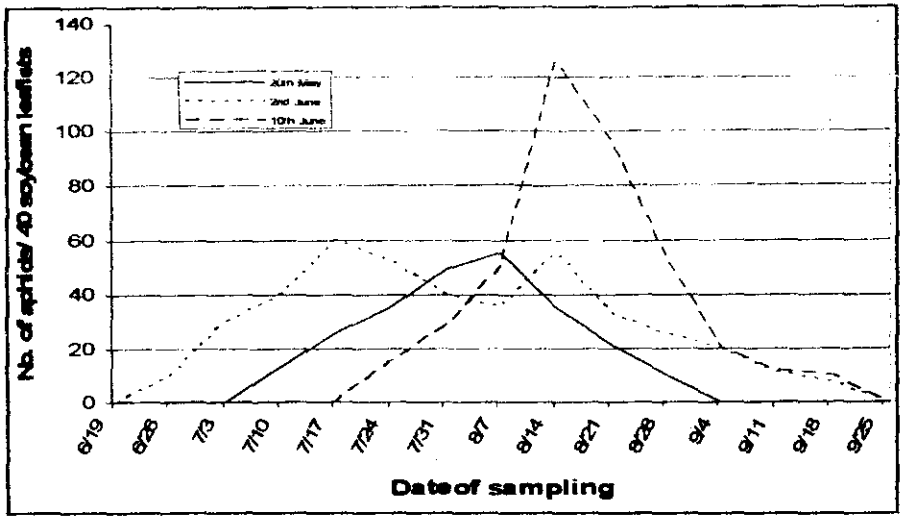

Fig. (1): Seasonal fluctuations of *A. gossypii* (Glov.) on soybean plants in the three sowing dates in the first location.

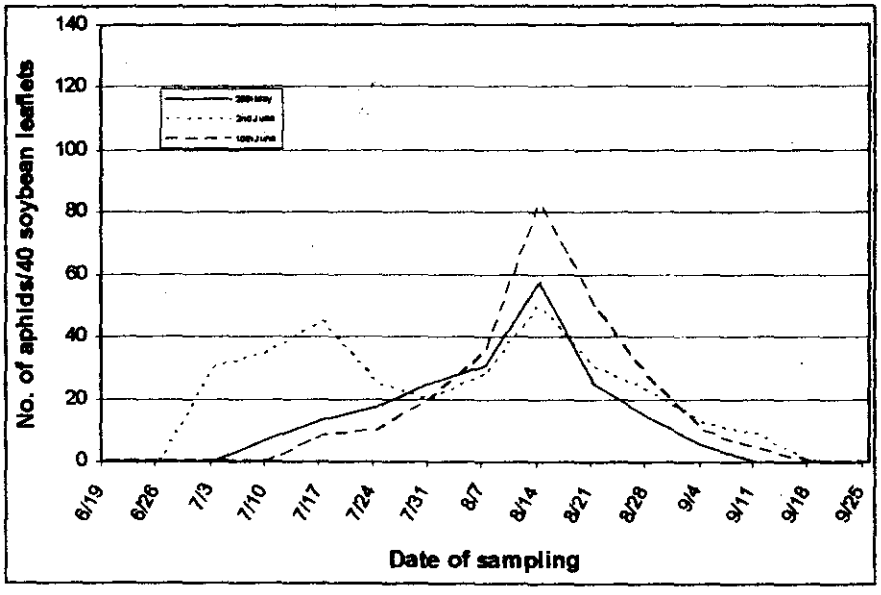

Fig. (2): Seasonal fluctuations of *A. gossypii* (Glov.) on soybean plants in the three sowing dates in the second location.

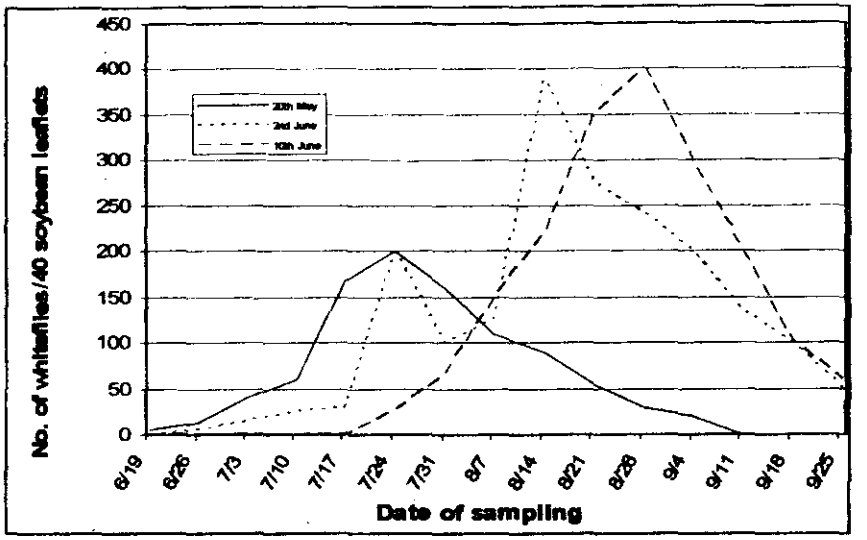

Fig. (3): Seasonal fluctuations of *B. tabaci* (Genn.) on soybean plants in the three sowing dates in the first location.

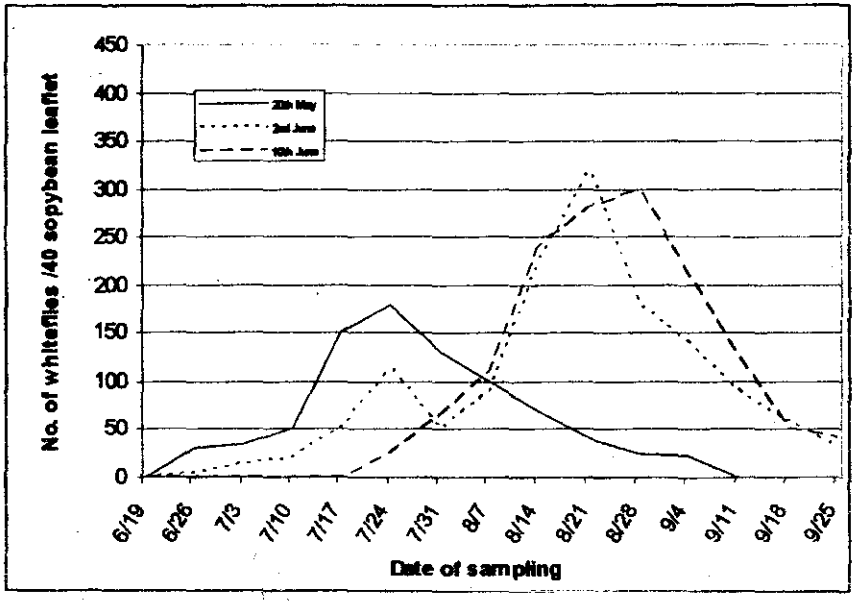

Fig. (4): Seasonal fluctuations of *B. tabaci* (Genn.) on soybean plants in the three sowing dates in the second location.

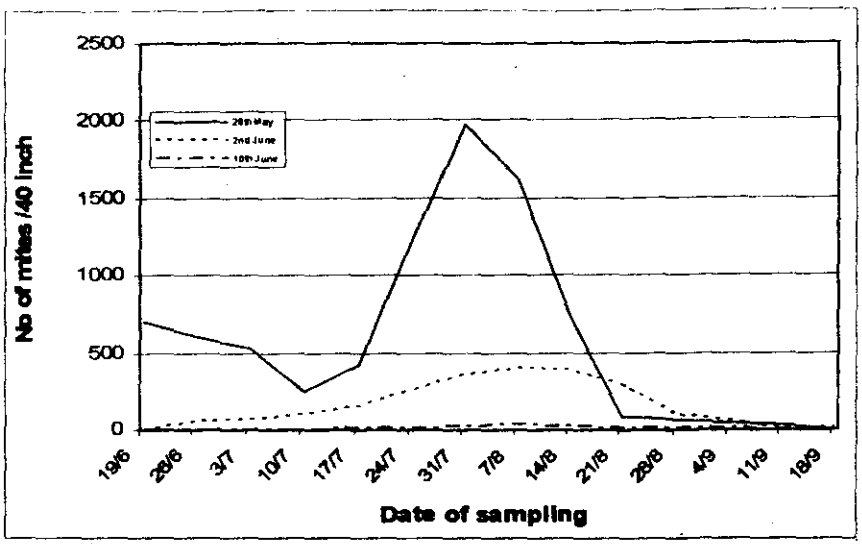

Fig. (5): Seasonal fluctuations of *T. arabicus* Attiah on soybean plants in the three sowing dates in the first location.

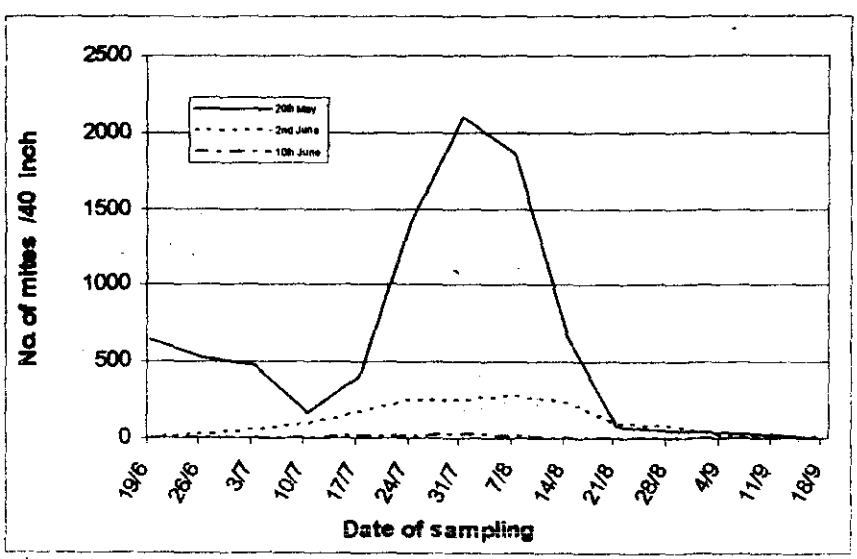

Fig. (6): Seasonal fluctuations of *T. arabicus* Attiah on soybean plants in the three sowing dates in the second location.

REFERENCES

El-Khouly A.S., E.M.E. Khalafalla, M.M. Metwally, H.A. Helal and A.B. El-Mezaien (1998). Seasonal abundance and population dynamics of certain sucking insects on soybean in Kafr El-Sheikh Governorate, Egypt. Egypt. J. Agric. Res., 76(1): 141-151.

El-Kifl, A.H., A.E.A. Wahab, M.A. Assem and A.A. Metwally (1974). List of insects, mites and pests associated with leguminous crops in Egypt. Bull. Soc. Ent. Egypt, 58: 297-302.

El-Saadany, G.B., A.A. Amin, M.A. Salem and A.M. Salman (2000). Cultivation dates in relation to four major insect pests attacking sorghum in Upper Egypt. Egypt. J. Agric. Res., 78(5): 1937-1957.

El-Sayed, A.A., A.A. Mansour, M.A. El-Moselhy and A.M.Orabi (1998). Effect of sowing date and seeding rate in barley production in the New Valley. J. Agric. Sci., Mansoura Univ., 23 (2): 451-459.

Ezueh, M.I. and Tylor, A.T. (1984). Effects of time of intercropping with maize on cowpea susceptibility to three major pests. Tropical Agriculture, 61(2): 82-86.

Marzouk I.A. and A.M.O. El-Bawab (1999). Effect of sowing date of barley on its infestation with the corn leaf aphid, *Rhopalosiphum maidis* (Fitch) (Homoptera: Aphididae) and yield components. Egypt. J. Agric. Res., 77(4): 1493-1499.

Metwally A.G. Samia (1999). Effect of planting date and certain weather factors on the population fluctuations of three insect pests infesting kidney beans in Qualyobia Governorate. Egypt. J. Agric. Res., 77(1): 139-149.

Shaheen, A.H. (1977). Survey of pests attacking soybean plants in Egypt with some ecological notes. Agric. Res. Rev., 55 (1): 59-65

التعداد الموسمى لبعض الآفات الثاقبة الماصة على فول الصويا فى مواعيد زراعة مختلفة

لوئيس صليب سوريال، ملاك فرج جرجس، فاضل خلف الدوينى، سميرة حنين مترى
معهد بحوث وقاية النباتات- مركز البحوث الزراعية- الدقى- الجيزة.

أجريت تجربتان حقليتان بمحافظه المنيا فى منطقتين لدراسة تأثير مواعيد زراعة فول الصويا على الاصابه بثلاث آفات ثاقبه ماصه وهى المن (من القطن) والذبابه البيضاء والعنكبوت الأحمر. مواعيد الزراعة كانت ٢٠ من مايو و ٢من يونيو و ١٠ من يونيو فى كلا المنطقتين.

دلت النتائج على أن تعداد حشرة المن فى نهاية الموسم فى المنطقتين المختبرتين كان اقل عندما زرع فول الصويا فى ٢٠ من مايو بالمقارنة بالميعادين الآخرين. وفى نفس الوقت كان مستوى الإصابة بالذبابة البيضاء أقل معنويا عند زراعة فول الصويا فى نفس التاريخ. ومن ناحية أخرى وجد عموما أن أنسب ميعاد لزراعة فول الصويا لتجنب الإصابة بالعنكبوت الأحمر هو الزراعة المتأخرة فى ١٠ من يونيو.