

EFFECT OF PHASEOLUS PLANTATION DATES ON THE POPULATION DENSITIES OF CERTAIN SUCKING PESTS

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ABSTRACT

Three Planting dates of Phaseolus plant "*Phaseolus vulgaris*" (L.) were tested for summer and fall plantation (Mid of February ,Mid of March and Mid of April) and (Mid of July ,Mid of August and Mid of September) throughout tow successive years (2001 & 2002) in Giza Governorate on different stages of the whitefly *Bemisia tabaci* (Genn.) and the common red spider mite *Tetranychus urticae* (Koch) as a cultural practices management . The obtained data of summer plantation revealed that there were non-significant effects of the tested planting dates on both Pests . In the summer plantation the early planting date showed that the least infestation of whitefly and common red spider mite was at the Mid of February and the highest was at the Mid of April . This may be refered to the increase of temperature and relative humidity. In fall plantation the early planting date showed that the least infestation of whitefly for the three developmental stages at the Mid of July and the highest was at the Mid of September but the population of the common red spider mite was disappeared after Mid of July .

INTRODUCTION

The common bean *Phaseolus vulgaris* (L.) in many parts of the world is an economic vegetable crop . In Egypt , this crop is attacked by several sucking pests which cause considerable damage to yield (El-Kifl, A.H. *et al.* 1974 and Doss,S. A. *et al.* 1992). The most injurious pests are the white fly, *Bemisia tabaci* (Genn.) and the common red spider mite, *Tetranychus urticae* (Koch).The seriousness of phaseolus plant infestation by the white fly and common red spider mite is not only due to their effect by feeding on plant sap but also due to the transmitting virus which reduced the yield (Matsui, M. and T.Nakashima 1992 and Nath, P. O.1994). The plantation data is considered one of the most important elements of agriculture pest management. It help to reduce the damage of these pests on the crop ;keep the environmental free from any hazards of intensive application of chemical insecticides frequency used and also saved money . The aim of the present investigation is to study the effect of planting dates on the population densities of whitefly, *Bemisia tabaci* (Genn.) and the common red spider mite *Tetranychus urticae* (Koch) during summer and fall plantation .

MATERIALS AND METHODS

The effect of phaseolus planting dates on the level of infestation by the adult and immature stages of the whitefly ;Egg and movable stages of common red spider mite were studied during two successive years

2001&2002 in three different dates at monthly intervals in both summer and fall cultivation (February 16th; March 17th; and April 17th) for the summer season and (July 16th; August 16th; and September 15th) for the fall season during 2001 and (February 15th; March 16th and April 15th) for the summer season and (July 15th; August 15th and September 14th.) for the fall season during 2002 season. This investigation stand up on Giza-6 phaseolus variety common cultivated in Egypt for local and export. The experiment was carried out in Giza Governorate. The experimental area was one feddan planted with Giza-6 cv. Divided into 3 equal blocks; each assigned to a different planting dates. The area of each planting date block was further divided into 4 replicates. The phaseolus plants leaflet were weekly examined after two weeks of planting, before sunrise; until harvesting. No chemical control were applied throughout the growing season. Hundred leaflet were randomly picked from each plot and transferred to the laboratory for estimation of infestation by the pests before mentioned. The number of each pest was recorded, and relationship between numbers of pest of *B. tabaci* and *T. urticae* and planting dates were estimated by counting the total number of moving stage and immature stages for both pests on both surfaces of leaflet. All the obtained results were statistically analyzed according to completely randomized design. Using "ANOVA" (analysis of variance) by Duncan multiple range test for variables in SAS program.

RESULTS AND DISCUSSION

The effect of the three planting dates of phaseolus plant infestation with different stages of white fly and common red spider mite in the summer and fall plantation during the two years of study (2001 and 2002) in Giza Governorate, are presented in Tables (1, 2) and Fig.(1, 2). The obtained data of summer plantation indicated that the rate of infestation of phaseolus plants by the two pests fluctuated and varied greatly with different planting dates Table(1) Fig.(1). The highest mean count per 25 leaflets of *B. tabaci* were 6.3; 40.0 and 32.8 for adult; immature and egg respectively for the third planting date Mid of April while in the early planting date Mid of February the data were 4.6; 39.4 and 21.3 for adult; immature and egg respectively during year 2001. Data showed that the same trend of infestation were 6.5; 39.1 and 36.1 for the highest infestation in the third date Mid of April while were 6.0; 38.0 and 27.7 for adult; immature and egg respectively during year 2002. This means that the early planting date was the best for the crop because it was little infestation this means that the highest infestation of whitefly was agreed with highly temperature and relative humidity.

Common red spider mite *T. urticae* infestation data during summer plantation 2001 showed that the numbers of Moving stage and egg were 42.7 and 54.4 for third planting date Mid of April while during Mid of February showed a little infestation 34.2 and 47.8 in the second year 2002 showed the same trend of infestation. The numbers were 46.3 and 52.1 for both Moving stage and egg for the third planting date Mid of April. The first planting date Mid of February showed the least infestation 35.3 and 42.5 for Moving and

egg respectively . This mean that the early planting date 16/2/2001 and 15/2/2002 seemed the least number of infestation while the lating to half of April the infestation of common red spider mite showed the highest number. This may be refered to increase of temperature (36.2 C°) and relative humidity (73.3%) .

The obtained data of fall plantation indicated that the highest count per 25 leaflets of *B. tabaci* were 4.2 ; 56.5 and 18.4 for adult ; immature and egg respectively for the third planing date Mid of September while for the early planting date Mid of July the data were 3.8 ; 43.7 and 9.5 for adult ; immature and egg respectively during year 2001 . In the second year 2002 data showed the same trend of infestation that were 4.7 ; 58.7 and 19.9 for adult ; immature and egg respectively for the highest infestation in the third planting date Mid of September while were 4.3 ; 37.4 and 10.6 for adult ;immature and egg respectively for the early planting date Mid of July. Common red spider mite *T.urticae* infestation data during fall plantation 2001 cleared that the numbers of Moving stage and egg were 22.3 and 26.4 respectively for the early planting date Mid of July . The same trend of infestation in 2002 population number were 22.8 and 26.9 for Moving stage and egg respectively . After this planting date Mid of July the animal pest has disappeared.

The variation in two pests inspection is probably due to change in weather factors and other ecological factors where temperature was favorable for rapid developmental stages of whitefly and common red spider mite were least abundant when temperature fluctuated between 31.9 C° to 36.2 C° . This results assessed the influence of planting date on the incidence of *B.tabaci* and *T.urticae* on bean (*Phaseolus vulgaris*) resulting that two pests was more important in planting made in April and September than in those made in February and July . This result were accompaniment with the authors Haydar (1983) ; Gergis (1987) and Fetoh (2003). On the other hand there is non -significant effects was found between sowing date and level of infestation by two pests whitefly and common red spider mite these are in agreement with much authors had been done on the effect of planting date on the infestation by different pests such as : El- Dakroury and Khalil (1982) ; El-Brolosy *et al.* (1984) ; El- Deeb *et al.* (1987) ; Hassanien *et al.* (1988); Helaly *et al.* (1990) and Metwally *et al.* (1994); Metwally (1999) ; Abd El-Aziz (2001) .

Table (1): Effect of Phaseolus planting dates on the infestation with the whitefly and common red spider mite during summer plantation for two years 2001/2002 in El-Giza Governorate .

Planting date	Mean of weather factors			Mean population density (per25 leaflets) at indicated planting dates (\pm S.E.)				
				<i>Bemisia tabaci</i>			<i>Tetranychus urticae</i>	
	Max. Temp	Mini. Temp	R.H.%	Adult	Immature (nymph & pupae)	Egg	Moving Stage	Egg
16/2/2001	31.9	15.1	72.9	4.6 \pm 1.8 (5 - 40)	39.4 \pm 26.9 (16 - 444)	21.3 \pm 14.1 (5 - 279)	34.2 \pm 19.6 (2 - 321)	47.8 \pm 14.6 (0 - 272)
17/3/2001	33.9	18.1	73.0	4.7 \pm 1.0 (10 - 30)	39.6 \pm 30.6 (7 - 501)	22.4 \pm 12.7 (10 - 214)	42.6 \pm 16.0 (19 - 338)	46.3 \pm 19.5 (25 - 412)
17/4/2001	36.2	22.0	73.3	6.3 \pm 2.3 (8 - 45)	40.0 \pm 23.0 (13 - 400)	32.8 \pm 15.3 (18 - 305)	42.7 \pm 15.04 (18 - 400)	54.4 \pm 27.2 (24 - 466)
15/2/2002	17.1	12.6	85.6	6.0 \pm 2.3 (4 - 46)	38.0 \pm 18.7 (17 - 311)	27.7 \pm 14.1 (15 - 254)	35.3 \pm 19.8 (3 - 263)	42.5 \pm 12.2 (0 - 260)
16/3/2002	29.5	14.9	85.5	6.2 \pm 1.9 (9 - 50)	38.3 \pm 25.8 (7 - 488)	29.1 \pm 12.8 (10 - 258)	46.0 \pm 28.2 (4 - 400)	51.8 \pm 7.7 (122 - 477)
15/4/2002	32.8	17.4	84.3	6.5 \pm 1.8 (11 - 59)	39.1 \pm 24.1 (16 - 468)	36.1 \pm 11.6 (8 - 247)	46.3 \pm 17.0 (20 - 368)	52.1 \pm 10.9 (91 - 305)
Grand mean				5.7 \pm 0.7	39.1 \pm 2.9	28.2 \pm 2.5	41.2 \pm 4.1	49.2 \pm 6.3
F. 0.05				18.2	445.4	247.8	185.5	490.3
L.S.D. 0.05				7.5	20.3	15.0	26.1	20.8

Numbers between brackets refer to the range of infestation.
Mean Population density per eight counts.

Table (2): Effect of Phaseolus planting dates on the infestation with the whitefly and common red spider mite during fall plantation for two years 2001/2002 in El-Giza Governorate .

Planting date	Mean of weather factors			Mean population density (per25 leaflets) at indicated planting dates (\pm S.E.)				
				<i>Bemisia tabaci</i>			<i>Tetranychus urticae</i>	
	Max. Temp	Mini. Temp	R.H.%	Adult	Immature (nymph & pupae)	Egg	Moving Stage	Egg
16/7/2001	35.0	23.1	86.1	3.8 \pm 1.4 (1 - 32)	43.7 \pm 21.6 (11 - 400)	9.5 \pm 3.4 (7 - 66)	22.3 \pm 9.0 (8 - 191)	26.4 \pm 12.0 (21 - 22)
16/8/2001	33.7	20.6	86.1	3.9 \pm 1.5 (4 - 30)	50.5 \pm 25.5 (9 - 453)	11.3 \pm 3.2 (15 - 74)	0.0	0.0
15/9/2001	29.5	16.3	86.2	4.2 \pm 2.3 (0 - 41)	56.5 \pm 26.2 (11 - 482)	18.4 \pm 9.2 (15 - 163)	0.0	0.0
15/7/2002	36.0	24.0	85.2	4.3 \pm 1.7 (5 - 38)	37.4 \pm 16.2 (19 - 314)	10.6 \pm 5.4 (4 - 101)	22.8 \pm 9.0 (11 - 189)	26.9 \pm 12.3 (10 - 219)
15/8/2002	33.3	21.0	74.9	4.5 \pm 1.9 (3 - 38)	51.9 \pm 23.5 (4 - 410)	14.3 \pm 5.3 (10 - 112)	0.0	0.0
14/9/2002	29.7	17.8	62.0	4.7 \pm 2.0 (3 - 44)	58.7 \pm 25.3 (11 - 439)	19.9 \pm 10.7 (13 - 184)	0.0	0.0
Grand mean				4.2 \pm 0.4	49.7 \pm 4.7	14.0 \pm 1.8	7.5 \pm 2.0	8.9 \pm 2.7
F. 0.05				39.2	225.1	70.5	27.0	45.9
L.S.D. 0.05				4.6	27.2	13.3	5.4	5.6

Numbers between brackets refer to the range of infestation.
Mean Population density per eight counts.

REFERENCES

- Abd El-Aziz , M. F. (2001) : Studies on some leaf mining insects infesting vegetable crops in Egypt . Ph. D. Thesis, Fac. of Agric. Al - Azhar Univ., Egypt.
- Doss, S.A. ; K. M. Adam ; F.A. Herakly and M.A. El - Hamaky (1992) : Population densities on the broad bean leaf miner, *Liriomyza trifolii* (Burgess) and cotton whitefly , *Bemisia tabaci* (Genn.) on protected cultivation, Mini J. Agric. Res., & Dev. 14 (3) : 787-797.
- Duncan, D. B. (1955) : Multiple range and multiple - F- tests . Biometrics, 11: 1-42 .
- El-Boroloy, F. M. , I. I. Ismail , M. A. Assem and F. Abdel - Aziz (1984) : Effect of planting dates on potato insect infestation . Agric. Res.Rev., 62 (1):169-177 .
- El - Dakrouy , F. and F. A. Khalil (1982) : Effectiveness of different sowing dates on the population density of some sucking insects attacking cotton plants . Proc. Egypt , National conf. , Ent. , Dec. ; 1982 vol. (1) : 223-230 .
- El-Deeb ,M .A ; Zeinab A . Mohamed and A.Shahein (1987) : Effect of sowing Date on population dynamics of *Liriomyza congesta* (Beck.) infesting lentil at Zagzig reigon . Zagazig J.Agric. Res., 14 (2) : 566-583 .
- El- Kifl, A. H. ; A.E.A. Wahab ; M. A., Assem and A. A. , Metwally (1994) : List of insect, mites and pests associated with leguminous crops in Egypt. Bull. Soc. Ent. Egypt , 58 : 297-302 (c.f. R.A.E. (A) 69 Abst., No. 3658).
- Fetoh, B. El-S.A.M (2003) : Development and implementation of integrated Pes management potato pest in Egypt. Ph. D. Tesis Fac. Science Ain Shams Univ. Cairo - Egypt. 141p.
- Gergis. M. F. (1987) : Biological , ecological and toxicological studies on The Potato tuber moth. *Ph. operculella*. Ph. D. Thesis. Fac. Agric. Minia Uni.
- Haydar, M. F. (1983) : Ecological and pest management studies on Potato Tuber moth *Ph. operculella* Zellr. Ph. D. Thesis. Fac. Agric. Ain Shames Univ., Egypt. 96 p.
- Hassanien , S. S., M. M. Helaly and A. H.Hegab (1988) : Effect of different sowing dates on certain insect attacking brood bean plantsat Zagazig. J. Agric. Res., 15 (2): 773-789.
- Helaly , M. M. , S. S. M. Hassanein and S. I. Yousif khalil (1990) : Effect of Sowing dates on cowpea infestation with certain pests at Zagazig, Egypt. J. App. Sci., 5(2): 64-76
- Matsui, M. and T. Nakashima (1992) : Damage to vegetables and ornamental plants by the sweet potato whitefly and its control in Japan . Japan Pesticide Information , 60 : 15-18.

- Metwally , S. A. G. (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.
- Metwally, M. E., Hassanein M.S. and Afsah, E. F. (1994) : Effect of planting date on population abundance of certain leaf pests infesting some – vegetable crops . *Egypt . J. Agri. Res.* **72**(4) : 977-989.
- Nath, P.O. (1994) : Effect of sowing time on the incidence of yellow mosaic virus disease and whitefly population on green gram. *Ann. Agric. Res.* **12** (2) : 174-177(c. f. R. A. E. (A) **83** Abst., No. 5470)
- S.A.S. Institute. (1988) : SAS/ Stat user's guide, 6.03 ed. SAS institute, cary,

تأثير مواعيد الزراعة على الكثافة العددية لبعض الآفات الثاقبة الماصه النسي
تصيب نباتات الفاصوليا فى الحقل
سالم عبد السلام هادى - مبروك عبد المنعم البسومى و حافظ اسماعيل حافظ عمر
معهد بحوث وقاية النباتات ، مركز البحوث الزراعية ، الدقى ، الجيزة ، مصر

تناول هذا البحث دراسة تأثير ثلاثة مواعيد للزراعة لمحصول الفاصوليا
" *Phaseolus vulgaris* " صنف جيزة ٦ خلال الزراعة الصيفيه (نصف فبراير، نصف
مارس ، نصف أبريل) والزراعة النيلية (نصف يوليو ، نصف أغسطس ، نصف سبتمبر)
فى محافظة الجيزة .

أوضحت النتائج المتحصل عليها خلال الدراسة :-

- أن الزراعة المبكرة خلال شهر فبراير أقل كثافة عددية لكلا من الحشرات الكاملة والحويرلات والبيض للذبابة البيضاء فى الموسم الصيفى ٢٠٠١ ، ٢٠٠٢ وربما يرجع ذلك الى انخفاض الحرارة والرطوبة خلال شهر فبراير بينما ازداد التعداد خلال شهر مايو للزيادة فى درجات الحرارة والرطوبة .
- أظهرت الدراسة أن الإصابة بأكاروس العنكبوت الأحمر العادى بكل من الأطوار المتحركة والبيض أنها أقل تعدادا فى العروة المبكرة (نصف فبراير) وأعلى فى العروة المتأخرة (نصف أبريل) فى العروة الصيفية وقد يرجع هذا للارتفاع الملحوظ لدرجتى الحرارة والرطوبة .
- أظهرت الدراسة - بالنسبة لتأثير مواعيد الزراعة فى العروة النيلية - أن الإصابة بالأطوار الثلاثة (حشرات كاملة وأطوار ناقصة وبيض) للذبابة البيضاء أنها أقل ما يمكن خلال نصف يوليو وأعلى مايمكن فى نصف سبتمبر ويرجع ذلك الى الارتفاع النسبى فى درجة الحرارة والرطوبة النسبية فى هذا الوقت من السنة .
- أوضحت النتائج أن مواعيد الزراعة لم تؤثر على الكثافة العددية للعنكبوت الأحمر العادى فى العروة النيلية لإختفاء الإصابة بالآفة فى هذا الوقت من السنة .