

Effect of Different Planting Dates on Level Infestation of Some Potato Plant Pests

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ABSTRACT

Potato variety cv. Cara was cultivated to study the effect of different planting dates on the levels of infestation by *Myzus persica* (sulzer), *Bemisia tabaci* (Genn.) and *Phthorimaea operculella* (Zeller) in four seasons (2010/2011, 2011/2012) summer seasons, (2011/2012, 2012/2013) Nili seasons at El Gharbia governorate. The data indicated that there were no significant differences between the different planting dates on the infestation by *Myzus persicae* (Sulzer) and *Phthorimaea operculella* (Zeller) during 2010/2011 and 2011/2012. Whereas, there were a significant differences between the other planting dates on the infestation by *B. tabaci* immature. On the other hand, there were no significant differences between the planting dates on the infestation by *Ph. Operculella* during two seasons.

Key words: Potato, planting dates, Pests, *Myzus persica* (sulzer), *Bemisia tabaci* (Genn.) and *Phthorimaea operculella*

Introduction

Many injurious pests attack potato plants causing serious losses in potato production unless management is developed, the occasional sever damage of these pests attributed to large population of the insect in the field or vectoring various disease to potato plants Lanunochetla and Pankaj Neog (2012), so it is very important to find new ways for controlling these pests.

In this study, three pests lead to economic loss of potato production were focused:

The green peach aphid, *Myzus persica* (sulzer) which causes appreciable damage to the crop (Alvarez and Srinivasan, 2005). The white fly, *Bemisia tabaci* (Genn.), attacks the potato crop in large population in Nili season and causes a sever decrease in the quality and quantity of the yield (Lacey *et al.* 2008).

The larvae of potato tuber moth *Phthorimaea operculella* (zeller). bore with in the leaves forming leaf miners. The foliage damage appear at different degrees of shriveling and the tuber tunnel results in partial or complete rotting and rendering it unfit for planting or for human consumption (Kroschel *et al.* (1996) and Sabbour and Ismail (2002)

On the other hand, Lanunochetla and Pankajneog (2012), observed the population of aphid and white fly during two seasons in potato crop (var. Kufri Jyoti) planted at three different dates.

So that in the present investigations aim to study the effect of different planting dates on the level of infestation by some potato pests.

Materials and Methods

Planting date:

The experiment area was divided in to three equal plots, each plot was assigned to a different planting date. Potato variety cv. Cara was cultivated in Three planting dates as shown in Table 1.

Table 1: The exact sowing and harvest dates in each case were as follow

Treatments	Planting date			
	1 st season	2 nd season	3 rd season	4 th season
1 st	12 th Dec.2010	1 st Oct. 2011	15 th Dec.2011	24 th Seb. 2012
2 nd	26 th Dec.2010	12 th Oct. 2011	26 th Dec.2011	15 th Oct. 2012
3 rd	12 th Jan. 2011	25 th Oct.2012	16 th Jan. 2012	24 th Oct. 2012

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The whole area was free from any pesticides treatment. Samples was taken after two months from planting date and prolonged to the harvesting time. 30 leaves of potato were picked from each replicate and continued weekly until the end of season. The leaves were picked, put in paper bags and transferred to the laboratory for examination using a stereo microscope to determine and record the different population of pests.

Results and Discussion

Effect of planting dates on the infestation by some potato plant pests during summer seasons:

Data presented in Table (2) shows the mean population of *Myzus persicae* (Sulzer) (adult) on potato plants in different three planting dates. The highest average number of *M. persicae* was recorded during season 2010/2011 on first planting date (summer potato) with an average 21.1 individuals /30 leaves, the second date recorded the lowest seasonal mean number, was 20.1 individuals /30 leaves. Whereas, on third planting date led to intermediate level of infestation, as a leaves harboured an average of 20.9 individuals /30 leaves. The highest average number of *M. persicae* during 2011/2012 season was recorded on latest planting date (summer potato) with an average of 22.6 individuals /30 leaves. As well as, the second date was recorded the lowest seasonal an average number, of 17.2 individuals /30 leaves. Also, on the first planting date led to intermediate level of infestation, with an average number of 21.6 individuals /30 leaves. (Table 2).

Table 2: Number of sampled *M. persicae* adult with in three planting dates at Gharbia Governorate 2010/2011&2011/2012 season.

Inspection dates	No. of adult 1 st planting date		No. of adult 2 nd planting date		No. of adult 3 rd planting date	
	2010/2011	2011/2012	2010/2011	2011/2012	2010/2011	2011/2012
Feb. 15	0.1	0.16	-	-	-	-
22	0.6	0.6	-	-	-	-
March 1	0.6	0.7	0.2	0.3	-	-
8	1	1.1	0.4	0.6	-	-
15	0.9	0.7	0.6	0.3	0.5	0.5
22	0.7	0.8	0.7	0.4	0.6	0.6
29	0.6	0.6	0.7	0.5	0.7	1
April 5	1.1	1.2	0.7	0.3	0.8	0.7
12	0.8	0.8	1.06	0.6	1.2	0.6
19	0.4	0.3	0.9	0.9	0.8	1.1
26	-	-	0.7	1.06	0.7	1.06
May 4	-	-	0.4	0.7	0.7	0.7
11	-	-	-	-	0.5	0.6
18	-	-	-	-	0.3	0.4
Total	6.7	6.96	6.36	5.66	6.8	7.26
Mean±S.E.	0.67±0.11	0.696±0.13	0.636±0.08	0.56±0.08	0.68±0.07	0.726±0.08
L.S.D	0.132	0.132	0.241	0.241	0.107	0.107

Statistical analysis of the data indicated that there were no significant differences between the different planting dates on the infestation by aphid insect *M. persicae* during 2010/2011 and 2011/2012. The level infestation of *Bemisia tabaci* (Genn.) immature stages on potato leaves at three dates (Nili Season) 2011/2012 are tabulated in Table (3).

The heaviest level infestation occurred on leaves at the latest sowing date with an average of 185.7 individuals/30 leaves, followed by first one, whereas recorded an average 81.7 individuals/30 leaves. on the other extreme, The lightest level infestation with *B. tabaci* immatures (42.9 individuals/30 leaves) was recorded on second planting date.

The highest average number of *B. tabaci* during season 2012/2013 was recorded on latest planting date with an average of 140.5 individuals /30 leaves. On the second date recorded the lowest seasonal mean number, was 46.1 individuals /30 leaves. Sowing on the first planting date led to intermediate level of infestation, with average of 75.6 individuals /30 leaves. Table (3).

Statistical analysis of the data indicated that there were significant differences between the level infestation of *B. tabaci* immatures as a result of different planting dates during 2011/2012 and 2012/2013.

Table (4) show the average number of *P. operculella* larvae were found infesting potato plants cultivated in three dates during season 2010/ 2011 and 2011/2012. The highest mean number of *P.*

operculella was recorded on latest planting date with average of 2.6 individuals /30 leaves. , The first date recorded the lowest seasonal mean number, were 1.2 individuals /30 leaves. Sowing on the second planting date led to intermediate level infestation, with mean of 1.7 individuals /30 leaves.

The highest mean number of *P. operculella* during season 2011/2012 was recorded on first planting date (summer potato) with 11.6 individuals /30 leaves. , The second date recorded the lowest seasonal average number, were 8.6 individuals /30 leaves. The third planting date leads to intermediate level infestation, with average of 9.7 individuals /30 leaves. (Table 4).

Statistical analysis of the data indicated that there were no significant differences between the different level infestation by *P. operculella* according to different sowing dates during 2010/2011 & 2011/2012 seasons.

Table 3: Number of sampled *B. Tabaci* immatures with in three planting dates at Gharbia Governorate 2010/2011 & 2011/2012 seasons.

Inspection date	No. of adult 1 st planting date		No. of adult 2 nd planting date		No. of adult 3 rd planting date	
	2010/2011	2011/2012	2010/2011	2011/2012	2010/2011	2011/2012
Nov.25	1.5	2	-	-	-	-
Dec. 2	2.3	2.1	1.06	1.3	-	-
9	3.2	2.8	1.9	1.8	6.1	3.2
16	1.4	1.6	1.6	1.8	13.2	4
23	5.4	3.3	1.9	2	3.9	4.1
30	5.7	4.4	2.2	2.3	4	3.9
Jan. 6	3.3	3.3	1.7	1.7	4.9	5.3
13	1.9	2.3	2.06	2.1	15.5	13
20	1.4	1.8	1.03	1.3	5.3	5
26	1	1.3	0.33	0.7	2.6	3
Feb. 4	-	-	0.4	0.4	2.9	2.8
11	-	-	-	-	3.1	2.5
Total	27.1	24.9	14.18	15.4	61.5	46.8
Mean±S.E.	2.71±0.55	2.49±0.25	1.41±0.24	1.54±0.2	6.15±1.49	4.68±1.02
L.S.D	1.21	1.21	2.21	2.21	0.988	0.988

Table 4: Number of sampled *Ph. Operculella* larvae with in three planting dates at Gharbia Governorate 2010/2011&2011/2012 seasons.

Inspection date	No. of larvae 1 st planting date		No. of larvae 2 nd planting date		No. of larvae 3 rd planting date	
	2010/2011	2011/2012	2010/2011	2011/2012	2010/2011	2011/2012
Feb. 15	0	0.1	-	-	-	-
22	0	0.3	-	-	-	-
March 1	0	0.4	0	0	-	-
8	0.06	0.7	0	0.13	-	-
15	0.03	0.4	0	0.2	0	0.03
22	0.1	0.4	0.06	0.3	0	0.1
29	0.06	0.3	0	0.3	0.03	0.26
April 5	0.03	0.4	0.1	0.4	0.06	0.3
12	0.03	0.36	0.1	0.5	0.16	0.5
19	0.06	0.4	0.06	0.3	0.13	0.6
26	-	-	0.1	0.4	0.2	0.4
May 4	-	-	0.03	0.4	0.1	0.3
11	-	-	-	-	0.06	0.2
18	-	-	-	-	0.06	0.3
Total	0.37	3.76	0.45	2.93	0.8	2.99
Mean±S.E.	0.037±0.01	0.37±0.04	0.04±0.01	0.29±0.04	0.08±0.02	0.29±0.05
L.S.D	0.059	0.059	0.107	0.107	0.048	0.048

Our results agree with many researches who studied the effect of planting date on potato pests infestation such as Mannan (2003) evaluated the individual and combined effect of sowing date, barrier crop for the suppression of potato aphid *Myzus persicae* (Sulzer) population, a three factor field experiment was conducted at the Regional Agricultural Research Station (RARS), Jamapur, Bangladesh. The factors were sowing dates (20 November and 5 December) use of barrier crops (wheat cv. Kanchan and Indian mustard cv. Jamalpur-1) and insecticides Malathion 57 EC and Azodrin 40 WSc. All factor

either individually or inseminations were found to have significant influence with some exception on the incidence of potato aphids, viral disease and yields.

Also, Temerak and Rizk (2009) tested two new potato cultivars (sakson and Bambino) which were planted on 6 and 12 February 2008 in Egypt. They suggested that the earlier planting date showed a significantly less infestation of the potato tuber moth (*P. operculella*) on foliage as well as tubers.

Whereas, our results agree with Lanunochetla and Pankaj Neog (2012) who observed that the population of aphid and white fly during two potato seasons planted at three different dates viz. recorded the highest peak of population of both aphid (2.97 /leaf) and white fly (2.20/ leaf) 43rd and 45th standard week of 15th September planting. The lowest count of both the Pests with 0.43 leaf was recorded on 1st standard week of 15th October planting and 39th standard week of 15th September planting.

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