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EFFECT OF SOWING TIME ON THE POPULATION OF CUTWORMS, *SPODOPTERA LITURA* (F.) AND *AGROTIS YPSILON* (ROTT.) ON SOME VEGETABLE CROPS

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Abstract

Results indicated that the population of *Spodoptera litura* (F.) on October and December sown crops was highest on cauliflower and lowest on carrot crops. Similarly the population of Agrotis ypsilon (Rott) in both sowing months was noted highest on spinach and lowest on brinjal crops. The statistical analysis showed that the population of both pests was significantly higher in December sown (late) crops as compared to October sown (early) crops.

Key words: sowing time, vegetable crops, Spodoptera litura, agrotis ypsilon,

Introduction

The tobacco caterpillar. *Spodoptera litura* F. and the greasy cutworm, *Agrotis ypsilon* (Rott.) (Noctuidae: Lopidoptera) are important polyphagus pests and cause considerable damage to many vegetables and the other crops in nursery and in the field. The larvae of *S. litura* defoliate the plant leaves and turn into soft tissues of the stem. Mid ribs and leaf salks (Baloch and Abbasi, 19977). Lohar (1991) reported that during investigation period *S. litura* attacked many vegetables/crops including cotton, mize, sorghum, cabbage, cauliflower, soybean, gram, pigeon peas, chickpeas, tobacco, tomato, spinach etc. (Helal and El-Sebay, 1982, Benerjee and Haque, 1985; Patel et al. 1986, Kolachi. 1990).

Similarly the cutworm. *A. ypsilon* is found attacking on crop seedlings by its habit of cutting off young plants.

Baloch and Abbasi (1977) and Lohar (1991) reported that *A. ypsilon* is the serious pest of cauliflower, spinach, tobacco, tomato, cowpeas, groundnuts and gram (Zhao, 1985; Naqvi, 1973).

Looking into the importance of these cutworm pests it has become necessary to adopt new methods of cultivation of our crops in order to decrease the pest infestation caused by the cutworm pests. During present studies an effort has been made to study the effect of sowing time on the population of cutworms. *Spodoptera litura F.* and *Agrotis ypsilon* (Rott.) On some vegetable crops.

Materials and Methods

Present studies were conducted at Latif Farm, Sindh Agriclture University, Tando jam during Rabi season of 1993-94. The seedlings of cauliflower, cabbage, carrots, cowpeas and brinjal were obtained from farmers nursery fields at Hala. Other crops i.e. coriander, spinach, brinjal and lucern were sown locally. All crops were planted in two different months i.e. October and December. 1993 in the R.B.C design plots (40 x 30 sq. ft.). Required agricultural practices were applied normally.

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Observations were started 15 days after sowing by observing 5 rows from each sub plot. Number of cutworms present on each plant were counted. The larval population of both cutworms on the crops sown in different months were recorded. The data was analysed statistically.

Results and Discussion

A. October sown vegetables

The result shown in table 1, indicate that the population of *S. liture* fluctuated on different vegetable crops i.e. cauliflower, cabbage, carrots, cowpeas, coriander, spinach brinjal and lucre sown in the month of October 1993. The data reveals that the maximum mean larval population of *S. litura* was recorded cauliflower (3.41 larvea/plant), cabbage (3,0) and carrots 2.24
larvae/plant), during the 3rd week of December, 1993 (19-12-1993). The maximum mean pest population on cowpeas was noted (2.22 larvae/plant) and on coriander (2.20 larvae/plant) was observed on 12-12-9193. The result thus suggests that the overall mean population of, litura i.e. during the observation from 1-11-1993 to 9-2-1992 was highest on cauliflower (1.77 larvae/plant), followed by cabbage (1.57), cowpea (1.25) coriander (1.18) and carrots (1.10 larvae pre plant).

B. December sown vegetables

The data given in table 2, indicates that the maximum larvae population of *S. liture* on December sown crops was observed on cauliflower (6.0 larvae/plant), followed by cabbage (5.84) carrots (4.86), cowpeas (5.86) and coriander (3.90)on12-3-1994.

Table 1. Effect of sowing time on the population (per plant) of *Spodoptera litura* on different vegetable crops sown in the month of October 1993.

Observations Date	Mean population /plant of *S. litura* on different crops					
	Cauliflower	Cabbage	Carrots	Cowpeas	Coriander	Mean
01-11-93	0.32	0.11	0.22	0.46	0.32	0.28
07-11-93	0.86	0.54	0.46	0.54	0.68	0.61
15-11-93	1.12	1.12	0.86	1.10	1.0	1.06
22-11-93	1.70	1.50	1.0	1.22	1.20	1.32
29-11-93	2.40	2.0	1.22	1.50	1.86	1.79
04-12-93	2.86	2.22	2.0	1.86	1.94	2.17
12-12-93	2.86	2.21	2.21	2.21	2.0	2.45
19-12-93	3.21	3.0	2.21	2.0	2.20	2.52
26-11-93	3.12	2.86	1.54	2.22	1.40	2.22
05-1-94	2.22	1.86	1.22	1.56	1.22	1.61
12-1-94	2.56	1.70	0.86	0.86	0.86	1.36
19-1-94	0.84	0.56	0.46	0.70	0.56	0.62
26-1-94	0.22	0.12	0.10	0.12	0.20	0.15

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03-2-94	0.12	0.11	0.10	0.10	0.11	0.10
09-2-94	0.01	0.01	0.01	0.01	0.02	0.01
Mean	1.64	1.37	0.96	1.09	1.03	

Observation dates = P<0.05

Crops = P>0.05

Table 2. Effect of sowing time on the population (per plant) of *Spodoptera litura* on different vegetable crops sown in the month of December 1993.

Observations Date	Mean population /plant of *S. litura* on different crops					
	Cauliflower	Cabbage	Carrots	Cowpeas	Coriander	Mean
1-1-94	0.86	0.46	0.32	0.76	0.80	0.64
8-1-94	1.20	0.58	0.98	1.20	1.0	0.99
15-1-94	1.68	1.20	1.0	1.40	1.26	1.30
22-1-94	2.20	1.46	1.22	1.86	2.46	1.84
29-1-94	2.46	1.86	2.20	2.84	2.86	2.44
5-2-94	3.46	2.46	2.86	2.96	3.40	3.02
11-2-94	3.80	2.86	3.0	3.20	3.86	3.34
20-2-94	4.86	3.80	3.20	3.46	4.20	4.86
26-2-94	5.20	4.86	4.0	4.20	4.86	4.62
5-3-94	5.54	4.96	4.26	5.20	4.92	4.97
12-3-94	6.0	5.84	4.86	5.86	3.90	5.29
19-3-94	4.0	3.86	5.0	3.84	3.20	3.98
26-3-94	3.86	3.30	3.20	2.20	2.0	2.91
1-4-94	2.0	1.12	1.20	1.00	1.40	1.34
8-4-94	0.86	0.80	0.20	0.32	0.54	0.54
Mean	3.198	2.638	2.502	2.810	2.710	

Observation dates = P<0.05

Crops = P>0.05

The result also suggests that the overall mean population of *S.litura* from 1-1-1994 to 8-4-1994 was highest in cauliflower (3.19 larvae/plant) followed by cowpeas (2.50). Analysis of the population of *S.litura* collected in October and December sown crops indicate that there is no significant difference among the various dates of observation. The analysis of data of both October and December sown crops indicate that there is significant diference in the population of *S. litura* on cauliflower ,cabbage, carrots, cowpeas and coriander crops.

Abdel Fattah et al (1977) reported that the cabbage, cowpeas, castor, sweet potato and lettue were the favorable foods for the larvae of the high contests of carbohydrates, nitrogen and essential growth elements in these vegetables. Similarly Zaz and kashwaha (1983)

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reported that the larval population of S. litura on cabbage cauliflower was positively correlated with temperature and humidity under field condition.

The result (table 3) on October sown crops show that the maximum mean larval population of A. ypsilon was observed on cabbage (3.0 larvae/plant) during the 3rd week of February 1994 (19-2-1994), and on spinach (3.96), cauliflower (2.40), brinjal (2.86) and lucern (3.0), during the 4th week of ypsilon during the observation period i.e. 1-11-1993 to 9-2-1993 was highest on spinach (1.60 larvae/plant), followed by lucern (1.56), cabbage (1.33), cauliflower (1.29), and brinjal(1.26).

B. December sown vegetables

The result given in table 4 indicate that the maximum mean larval population of A. ypsilon was observed on cabbage (5.25 larval/plant) followed by cauliflower (4.46) and brijal (3.0), during the 4th week of February (6-2-1994) whereas the maximum mean population of spinach (5.54), and lucern (4.68) was recorded during the first week of march 1994 (5-3-1994), The over all mean population of the larvae of A. ypsilon on December sown crop was noted on spinach (2.3), cabbage (2.28) and brinjal (1.46) crops .

The analyses of data indicate that there is no significant difference between the population of S.ypilon on different crops but there is a highly significant difference among the observation dates.

Similarly many other scientists have reported that A. ypsilon is the serious pest of many vegetables, causing damage to the crops in nursery (Omaino et al(1973 Griffiths, 1974, Archer et al , 1980, kim and kim, 1981, Lahor 1991).

The correlation analysis show that there was more population of S. litura and A. ypsilon on December (late) sown:

Table 3. Effect of sowing time on the population (per plant) of Agrotis ypsilon on different vegetable crops sown in the month of October 1993.

Observations Date	Mean population /plant of S. litura on different crops					
	Cauliflower	Cabbage	Carrots	Cowpeas	Coriander	Mean
1-1193	0.10	0.34	0.36	0.22	0.46	0.87
7-11-93	0.32	0.46	0.48	0.76	0.86	0.57
15-11-93	0.46	0.86	1.0	0.98	1.0	0.86
22-11-93	1.0	1.0	1.42	1.22	1.24	1.17
29-11-93	1.22	1.24	1.46	1.46	1.94	1.46
4-12-93	2.42	1.86	1.50	1.86	2.24	1.97
12-1293	2.86	2.0	1.86	2.0	2.86	2.31
19-12-93	3.0	2.42	2.0	2.42	2.0	2.36
26-12-93	2.20	3.86	2.40	2.86	3.0	2.86
5-1-94	1.10	3.0	1.22	1.0	2.20	1.70
12-1-94	0.88	2.44	1.0	086	1.86	1.40
19-1-94	0.54	1.0	0.76	0.54	0.54	0.67
26-1-94	0.20	0.46	0.32	0.22	0.12	0.26
3-2-94	0.12	0.22	0.20	0.18	0.11	0.16
9-2-94	0.01	0.10	0.10	0.10	0.04	0.07
Mean	1.09	1.41	1.07	1.11	1.36	

Observation dates = $P<0.05$

Crops = $P> 0.05$

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Table 4. Effect of sowing time on the population (per plant) of Agrotis ypsilon on different vegetable crops sown in the month of October 1993.

Observations Date	Mean population /plant of S. litura on different crops					
	Cauliflower	Cabbage	Carrots	Cowpeas	Coriander	Mean
1-1-94	0.24	0.46	0.86	0.56	0.56	8.53
8-1-94	0.46	0.86	1.20	0.86	0.92	0.86
15-1-94	0.86	1.56	1.56	1.0	1.40	1.25
22-1-94	1.45	2.24	2.0	1.46	1.80	1.78
29-1-94	2.	2.86	2.46	2.22	2.48	2.48
5-2-94	3.20	3.32	3.86	2.26	3.86	3.1
11-2-94	3.86	5.84	3.96	3.0	3.56	3.64
20-2-94	3.96	4.92	4.22	2.20	3.88	3.83
26-2-94	5.26	5.0	4.46	2.24	4.28	2.24
5-3-94	4.86	5.54	3.0	1.80	4.68	3.97
12-3-94	3.20	4.24	2.46	1.56	3.0	2.89
19-3-94	2.0	3.46	2.20	1.0	2.56	2.24
26-3-94	1.24	2.0	1.0	0.86	2.20	1.46
1-4-94	0.86	1.24	0.86	0.56	1.20	0.94
8-4-94	0.60	0.54	0.54	0.42	0.80	0.58
Mean	2.228	2.800	2.800	2.309	1.466	2.405

Observation dates = $P<0.05$

Crops = $P> 0.05$

Crops as compared to October sown crops. However there was significant difference between the population of both months.

References

1. Abdel Fattah, M. I., Y.S. Saleem, and M.I.Abdel Majeed. (1977). Effect of larval diet on the development and fecundity of cotton leafworm, Spodoptera littoralis (Boid). Zeitschrift fur Angewandte Entomolgie. 84 (3): 311-315.

2. Archer. T.L., G.L. Musick. And R.L. Murray.(1980).Influenceoftemperature and moisture on black cutworm(lepidoptera:Noctuidae) development and reproduction. Canadian Entomologist. 112 (7): 665-673.

3. Baloch. S.H. And Q. Abbasi. (1977). Investigations on the ecology and biology of cutworm (Noctuidae:Lepidoptera) in Hyderabad Regions. 1st Ann. Res. Rept. Pak. Sc. Foundation Project No. Ac/Agri. (38) Deptt. Ent. SAU, TandoJam. Pak. P.80.

   Banerjee, T.C., and N. Haque. (1985).

4. Influence of host plants on development, fecundity and egg hatchability of the arctiid month diatrisia easignetum. Ento. Exp. Apple. 37: 193-198.

5. Griffiths, D.C. (1974). Susceptibility of plant to attack by wire worms (Agrotis spp.). Annual of Applied biology. 78 (1): 13-99.

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6. Helal. H., and Y. el-sebay. (1982). The effect on the host and host preference and the eucalyptus borer Phorancantha semipunctata F. (Cerambycidae; Coleoptera) in Egypt. Agri. Res. Review 58: 31-37.

7. Kim. H.S., and H. Kim. (1981). Survey on the dominant species of cutworms in several localities. Korean Journal of Plant Protection. 29 (3): 181-182.

8. Kolachi, Z.H. (1990). Effect of different host plants on the biology and toxicity of insecticides to S. litura Fam.Sc. thesis submitted to the Sindh Agriculture University, TandoJam pp-48.

9. Lohar, M.K. (1991). Quantitative survey of population trends of Heliothis armigera Hb.and its natural enemies on the various plants in Hyderabad district. Final Research Report. Pakistan Science Foundation Project No. SAU/bio (152). Deptt. Entomology Sau, Tandojam 46 pp.

10. Naqvi, K.M. (1973). Insect pest of cotton in Sindh and their control seminar on cotton disease and weed control. Hyderabad. 30th of May.

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