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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* on October and December sown crops was highest on cauliflower and lowest on carrot crops. Similarlary the population *of Agrotis. ypsilon* on 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 on December sown (late) crops as compared to October sown (early) crops.

Key Word: Population, Cut worms, vegetable crops.

Introduction

The tobacco caterpillar, *Spodoptera litura* F. and the greasy cutworm, *Agrotis ypsilon* (Rott.) (Noctuidae: Lepidoptera) 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, 1977). Lohar (1991) reported that during investigation period *S. litura* attacked many vegetables/crops including cotton, maize, sorghum, cabbage, cauliflower, soybean, gram, pigeon peas, chick peas, tobacco, tomato, spinach etc. (Helal and El-Sebay, 1982; Benerjee and Haque, 1985; Patel *et al*, 1986 and Kolachi, 1990).

Similarly the cutworm, *A. ypsilon* is found atacking 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 (Naqvi, 1973 and Zhao, 1985).

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 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 Method

Present studies were conducted at Latif Farm, Sindh Agriculture University, Tandojam 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.

Observations were started at 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 results shown in table-1, indicate that the population of *S. litura* fluctuated on different vegetable crops i.e. cauliflower, cabbage, carrots, cowpeas, coriander, spinach, brinjal and lucern sown in the month of October 1993. The data reveals that the maximum mean larval population of *S. litura* was recorded on cauliflower (3.41 larvae/plant),

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cabbage (3.0) and carrots (2.24 larvae/plant), during the 3rd week of December, 1993 (19-12-1993). The maximum mean pest population of cowpeas (2.20 larvae/plant) was observed on 12-12-1993. The results thus suggest that the overall mean population of *S. litura* i.e. during the observation from 1-11-1993 to 9-2-1994 was highest on cauliflower (1.77 larvae/plant), followed by cabbage (1.57), cowpeas (1.25) coriander (1.18) and carrots (1.10 larvae per plant).

B. December sown vegetables

The data given in table-2, indicates that the maximum larvae population of *S. litura* on December sown crops was observed on cauliflower (6.0 larvae/plant), followed by cabbage (5.840), carrots (4.86), cowpeas (5.86) and coriander (3.90) on 12-3-1994.

The results also suggest that the overall mean population of *S. litura* from 1-1-1994 to 8-4-1994 was highest on cauliflower (3.19 larvae/plant) followed by cowpeas (2.81), coriander (2.71), cabbage (2.62) and carrots (2.50). Analysis of data of the population of *S. litura* collected on October and December sown crops indicate that there is no significant difference between different crops. However, there is highly significant difference concerning the various dates of observation. The analysis of data of both October and December sown crops indicate that there is significant difference in the population of *S. litura* on cauliflower, cabbage, carrots, cowpeas and coriander crops.

Table 1

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

Observation 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
	3.198	2.638	2.502	2.810	2.710	

Observation dates = $P<0.05$
Crops = $P>0.05$

The results also suggest that the overall mean population of *S. litura* from 1-1-1994 to 8-4-1994 was highest on cauliflower (3.19 larvae/plant) followed by cowpeas (2.81), coriander (2.71), cabbage (2.62) and carrots (2.50). Analysis of data of the population of *S. litura* collected on October and December

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sown crops indicate that there is no significant difference between different crops. However, there is highly significant difference concerning the various dates of observation. The analysis of data of both October and December sown crops indicate that there is significant difference 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 favourable foods for the larvae of *S. litura* because of the high contets of carbohydrates, nitrogen and essential growth elements in these vegetables. Similarly Zaz and Kashwaha (1983) reported that the larval population of *S. litura* on cabbage cauliflower was positively corelated with temperature and humidity under field conditions.

Table 2

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

Observation date	Mean population/plant of *S. litura* on different crops					
	Cauliflower	Cabbage	Carrots	Cowpeas	Coriander	Mean
1-11-93	0.10	0.34	0.63	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
12-12-93	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	0.86	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 = $P>0.05$

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 December (26-12-1993). The overall mean population of *A. ypsilon* during the observation period i.e. 1-11-1993 to 9-2-1994 was highest on Spinach (1.60 larvae/plant). Followed by lucern (1.56), cabbage (1.33), cauliflower (1.29) and brinjal (1.26).

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B. December sown vegetables

The results given in table-4 indicate that the maximum mean larval population of *A. ypsilon* was observed on cabbage (5.25 larvae/plant) followed by cauliflower (4.46) and *brinjal* (3.0) during the 4th week of February (6-2-1994) where as the maximum mean population on spinach (5.54) and lucern (4.68) was recorded during the 1st week of March 1994 (5-3-1994). The overall mean population of the larvae of *A. ypsilon* on December sown crops was noted on spinach (2.8 larvae/plant) followed by lucern (2.4), cauliflower (2.3), cabbage (2.28) and brinjal (1.46).

The analysis of data indicate that there is no significant difference between the population of *A. ypsilon* 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 (Omino *et al*, (1973, Griffiths, 1974, Archer *et al*, 1980, Kim and Kim, 1981 and Lohar 1991).

The correlation analysis shows that there was more population of *S. litura* and *A. ypsilon* on December (late) sown crops as compared to October sown crops. However there was significant difference between the populations of both months.

Table 3

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

Observation 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	0.53
8-1-94	0.46	0.86	1.20	0.86	0.92	0.86
15-1-94	0.86	1.46	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	2.40	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	3.86	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	2.309	1.466	2.405	

Observation dates = $P<0.05$
Crops = $P>0.05$

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