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Impact of planting and harvesting dates on Infestation of Potato with cutworm *Agrotis ipsilon* (Hufn)

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Abstract : Potato is one of the world's major noncereal food crop. It is an important food crop of India. It is grown in almost all states of India under very diverse conditions. In India, the major production area of potato (about 74%) is located in three states namely Bihar, U.P. and West Bengal. It is attacked by more than 100 Arthropod pests, of which about 80 have been reported in India. Out of various insect pests, potato cutworm. *Agrotis ipsilon* Hufn is very destructive in Bihar. Present investigation was carried out to study the impact of planting and harvesting dates on infestation of potato with *Agrotis ipsilon*. This was observed that there was minimum tuber damage in late planted and late harvested potato in treated and untreated plots.

***Keywords:: Potato**, Pest, Infestation, Cutworm, Agrotis ipsilon, Planting date, Harvesting date*

INTRODUCTION

Potato *Solanum tuberosum (L)* is one of the world's major noncereal food crop grown in a wide variety of soil and climates surpassed only by wheat, Rice and Maize in total production. It is an important food crop of India. It is grown in almost all states of India under very diverse conditions. In India, the major production area of potato (about 74%) is located in three states namely Bihar, U.P. and West Bengal. In contrast to 120–180 days crop duration of potato in temperate countries, the crop duration in India is about 90 days only. Potato is store house of energy and nutrition. It is a rich source of starch and sucrose. It also contains crude protein, pure protein, vit. C, phosphorus and potassium. Detailed studies of Indian potato varieties by Pushkarnath (1976)[1] recognized sixteen locally established or desi varieties. Potato is attacked by more than 100 arthopod pests, of these about 80 have been reported in India. Out of various insect pests of potato,*Agrotis ipsilon* (Potato cutworm) is very destructive in Bihar (Kumar & Kumar, 2005)[2] & (Kumar &Tiwary, 2009)[3]. The larvae of this insect pest damage the crop in its initial stage by cutting the young plants and their bases near the ground level and later on by feeding on the shoots resulting to retarding the plant growth and crop yield. After tuberization, they feed by boring and nibbing into tubers. Present investigations were carried out to study the impact of planting and harvesting dates on infestation of potato with *Agrotis ipsilon* (Cutworm) in Muzaffarpur during 2015–16.

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METHODS & MATERIALS

A field trial was conducted in randomized block design and replicated four times at four dates of planting i.e. 20th October, 5th November, 20th November and 5th December divided in equal parts i.e. treated and untreated. The treated plots were used with sprays of chlorpyrifos 20 EC twice by drenching method on ridges once at earthing time and second 21 days after the first spray. The plot size and spacing were 4.25 × 3m^2 and 60 × 20 cms respectively. Kufri Sinduri variety of potato was used for this experiment. All the agronomic practices were done as per schedule. Harvesting was done after 75 days of planting i.e. 5th January, 20th January, 5th February and 20th February. Observations on the incidence of larval and pupal population was recorded in the crop. The extent of damage of both plant foliage and tubers by number and weight was recorded at weekly intervals in each treatment and replication.

RESULTS AND DISCUSSION

Results obtained are summarized in Table–1 and Figure–1. From the data of the table, it is evident that incidence of cutworm was varied with planting and harvesting times of potato. The plant foliage and tubers damage both varied with different dates of planting in both untreated and treated plots. On the basis of pooled data of observations, the average foliage damage was recorded between 1.45% to 2.40% and 0.25% to 0.48% in untreated and treated plots respectively. The maximum foliage damage (2.40%) was recorded in D_3 (planted in 20thNovember) while minimum (1.45%) in D_2 (planted on 5th November) in untreated plots. In treated plots, the maximum foliage damage (0.48%) was recorded in D_3 (planted on 20th November) while minimum (0.25%) in D4 (planted on 5thDecember). Results of the Table–1 also indicated that tuber infestations varied with date of planting. In untreated plots, it was maximum (14.75% by number and 13.75% by weight) in D_3 while minimum (5.25% by number and 5.65% by weight) in D4. In treated plots (treated with chlorophyrifos 20 EC @ 2.5 l/ha twice, first and earthing and second after 21 days of first spray), maximum infestation of tuber (2.00% by number and 2.50% by weight) was recorded in D_2 while minimum (1.00% by number and 1.10% by weight) in D_4. It is evident from thedata that minimum infestation of foliage is not same in treated & untreated plots but the minimum infestation of tuber is same D4 (planted on 5th December) in untreated and treated both plots. Simpson (1977)[4] reported that more than 100 Arthropod pests damage potato crop in various parts of the world. Mishra and Agrawal (1988)[5]have given a comprehensive list of insect and non insect pests damaging potato in different parts of India. Kumar and Kumar (2005)[2] reported *Agrotis ipsilon* as a serious pest of potato in Bihar. Gulab Ram et al (2001)[6] reported that Kufrichandramukhi variety of potato suffered maximum damage (foliage& tuber both) by *Agrotis ipsilon*. Present investigation suggested that there was minimum tuber damage in late planted and late harvested potato both in treated and untreated plots. Misra and Agrawal, (1988)[5] reported that the early harvesting resulted maximum tuber damage in comparison to medium and late harvested crops. Mohammed, (2012)[7] also recorded the impact of planting dates on infestation of cucumber plants with whitefly, *Bemisiatabaci*. Rajendran and Verma (1989)[8] reported that chlorpyrifos was most effective in reducing both plant and tuber damage of potato by cutworm, thus chloropyrifos was taken during investigation.

Table–1 Impact of planting and harvesting dates on infestation of potato with cutworm *Agrotis ipsilon* (Hufn)

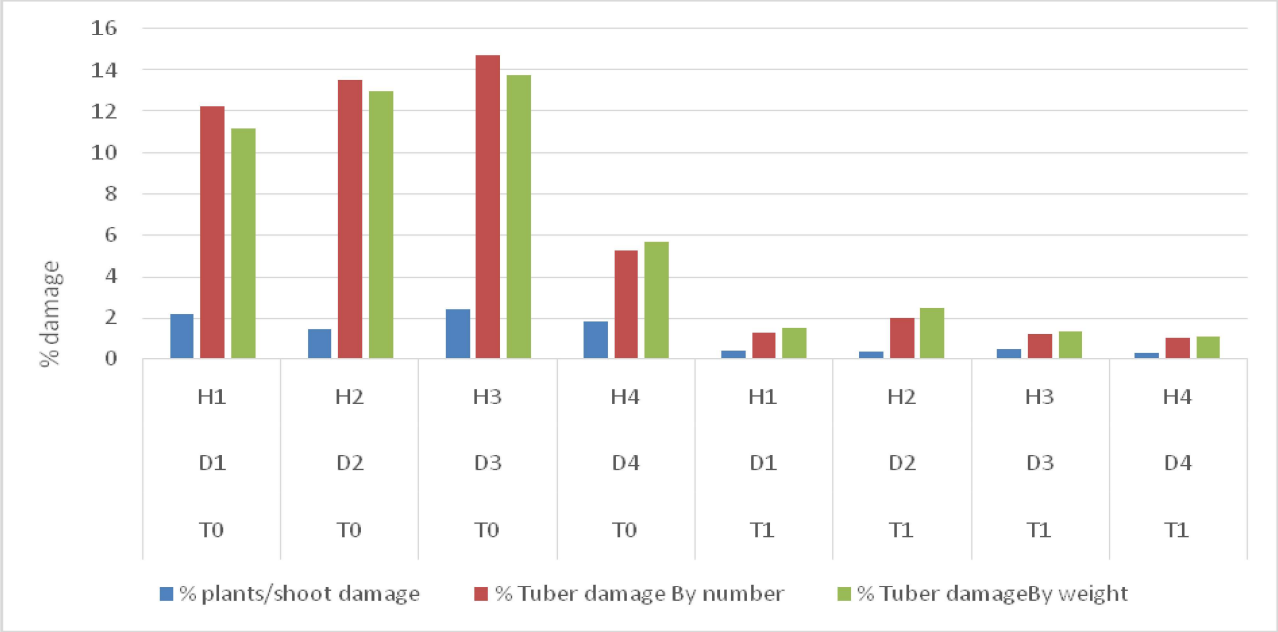
Treatments	Date of plantings	Date of Harvesting	% plants/shoot damage	% Tuber damage	
				By number	By weight
T0	D1	H1	2.15	12.25	11.15
T0	D2	H2	1.45	13.50	13.00
T0	D3	H3	2.40	14.75	13.75
T0	D4	H4	1.80	5.25	5.65
T1	D1	H1	0.35	1.25	1.50
T1	D2	H2	0.30	2.00	2.50
T1	D3	H3	0.48	1.20	1.30
T1	D4	H4	0.25	1.00	1.10

T0 = untreated plots
T1 = Treated plots with Chloropyrofos 20 EC @ 2.5 l/h twice, first at earthing and second after 21 days of first spray.

D = Date of plantings
D1 = 20th October, 2015
D2 = 5th November, 2015
D3 = 20th November, 2015
D4 = 5th December, 2016

H = Date of Harvestings
H1 = 5th January, 2016
H2 = 20th January, 2016
H3 = 5th February, 2016
H4 = 20th February, 2016

FIGURE- 1 Impact of planting and harvesting dates on infestation of potato with cutworm *Agrotis ipsilon* (Hufn)



T0 = Untreated
D = Date of planting
D1 = 20th October
D2 = 5th November
D3 = 20th November
D4 = 5th December

T1 = Treated with chlorpyrifos
H = Date of Harvesting
H1 = 5th January
H2 = 20th January
H3 = 5th February
H4 = 20th February

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