

**Evaluation of damage severity of cutworm in different variety of potato at various growing areas**M.A. Monim, A.B.M.S. Islam<sup>1</sup>, M.A. Quddus<sup>2</sup>, R. Ali<sup>3</sup> and A.S.M.A. Monim<sup>4</sup>Oil Seed Research Center, RARS, BARI, Rahmatpur, Barisal, <sup>1</sup>Soil Resource Development Institute, Jamalpur; <sup>2</sup>Pulses Research Sub Station, BARI, Madaripur, <sup>3</sup>RARS, BARI, Jamalpur and <sup>4</sup>Department of Agronomy, Sher-e-Bangla Agricultural University, Dhaka.

**Abstract:** The experiment was conducted at three different locations namely Barisal, Munshiganj and Mymensingh in Bangladesh during rabi season of 2007-08 using five potato varieties and it was repeated 2008-2009. Five potato varieties namely Diamant, Cardinal, Patrones, Granola and Espirit was tested against cutworm, *Agrotis ipsilon*(Hufner). Percent Plant damage up to 40 days, the variety Diamant show less damage by cutworm in both three locations, that was Barisal (1.14), Munshiganj(1.62) and Mymensingh(1.88) respectively. But maximum damage was recoded in Patrones for all locations. Percent of damage tuber no. was the lowest in Cardinal, Granola and Patrones at Munshiganj. The yield of potato was higher in the variety of Diamant and Cardinal for all locations.

**Key words:** Evaluation, Damage, Severity, Cutworm, Potato.

**Introduction**

Potato (*Solanum tuberosum* L.) is globally an important food crop grown almost all over the world. It is high yielder, commercial low cost, palatable and nutritious. Considering the nutritive value, it is a crop-per-excellence, having carbohydrates in abundance, proteins of superior quality, minerals and fibers in appreciable amounts, vitamin C in sufficient quantity and some B vitamins in high or reasonably good quantity (Ahmed, 1982). The fat content of potato is only 0.4% compared to 0.7% in rice and 2.3% in wheat flour. It also produces considerable dry matter per unit area compared to many other crops. Potato is a wholesome food and it provides essential body building substances. Potato is used as a vegetable crop in many countries but it is a staple food in some countries. As an industrial crop, potato is a raw material of various food and confectionaries. It is used produce dextrose. Potato is the third largest food and vegetable crop in Bangladesh (Hussain, 1995). Every year, Bangladesh Government imports Potato from Holland by costing a huge amount of foreign currency. Potato is one of the most sensitive crops to soil water stress and it is recognized as a major constraint to potato production worldwide (Schapendonk et al., 1989). Jamieson (1985) found that the yield of tubers increased 45 to 55 kg/ha for each millimeter of water applied. The cutworm, *Agrotis ipsilon*(Hufner) is a serious pest of potato crop in Bangladesh. The larvae not only cut the young plants or shoots at the ground level but also make damage by boring into the tubers. In Bangladesh, cutworm makes more damage by boring into the tubers rather than by cutting the young plants or shoots. The tuber damage by the pest in this country ranges from 5-75% depending upon locality and year without any control measure being taken. Cutworm is one of the major pest of potato crop in eastern genetic plants and causes 35-40 percent tuber damage and 35 percent plant damage (Konar and Chettri, 2003). So the present experiment was under taken to find out the damage severity of cutworm in different varieties of potato.

**Materials and Methods**

The experiment was conducted at three locations namely Barisal, Munshiganj and Mymensingh in Bangladesh during rabi season of 2007-08 using five potato varieties and it was repeated 2008-2009. Fertilizers were applied at 350-250-270-120-120-106 kg/ha of urea, TSP, MP, gypsum, magnesium, sulphate, zinc sulphate and borax

respectively, as recommended for Bangladesh (Anon, 2004). One half of urea and full dose of all other fertilizers were applied at the time of planting. Other half of urea was applied as side dressing after 30 days of planting when first earthing up was done. During land preparation, cowdung was applied at 10ton/ha. In all the years, seed tubers were planted on 30 November. During the crop (rabi) season of 2007-2008 and 2008-2009, seed tubers were preserved in the cold storage. The experiment was laid out in a randomized complete block design (RCBD) with three replications. The unit plot size was 5m X 4m. Whole tubers were planted maintaining 60 cm row to row and 25 cm seed to seed distances. Intercultural operations, such as irrigation was given twice, weeding, mulching and earthing up were done as and when necessary. Fungicide, Dithane M-45 was applied at 0.25% to protect the crop from fungal disease. Five potato varieties were used Diamant, Cardinal, Patrones, Granola and Espirit. No insecticide was applied during the cropping period. Percent of plant damage up to 40 days was recoded for damage at vegetative stage. The crop was harvested on February, 08, 09. After harvest data on the percent of tuber damage and non-infested by number and weight and yield of tubers, no of hole/ damage tuber were collected and analyzed in the computer for Randomized Complete Block Design (RCBD) and analysis of variance (ANOVA) with Duncan's Multiple Range Test (DMRT)(Gomez and Gomez, 1984).

**Results and Discussion**

In 2007-08 crop (rabi) season, incidence of cutworm infestation was on different varieties at three locations viz., Barisal, Munshiganj and Mymensingh. Irrespective of locations, three were significant effect among the potato varieties on used parameters in relation to cutworm (Tables 1-3). At Barisal, plant damage due to cutworm ranged 1.14 -7.18. Significantly lower damage was recorded in Diamant and it differed significantly with rest varieties. The effect of Cardinal, Patrones and Granola in relation to number of hole per damage tuber were insignificant. Number of damage tuber among the varieties ranged 4.07-7.55% (Table 1). The maximum percent damage tuber infestation recorded in Petrones followed by Cardinal, Granola and they were statistically similar trend became evident in case of damage tuber percent by weight like damage tuber. Regarding non infested tuber number,

it ranged among the varieties 92.21-95.22%. More or less similar trend was observed when non- infested tuber by weight considered. In respect of yield, the highest yield of 32.38 t/ha was computed by Diamant followed by

Cardinal and they were significantly similar and it differed significantly with rest varieties. Almost similar information was made by (Anon, 2009) in this country.

**Table 1.** Damage severity by potato cutworm at Barisal

Variety	Plant damage up to 40 days (%)	No. of hole/ damage tuber	Damage tuber (%)		Non-infested (%)		Yield (t/ha)
			Number	Weight	Number	Weight	
Diamant	1.14e	1.83ab	4.07c	7.15ab	93.02ab	92.77bc	32.38a
Cardinal	2.21d	1.44 b	6.68ab	5.05c	95.22a	95.99a	30.22a
Patrones	7.18a	1.31b	7.55a	6.20bc	95.04a	93.72ab	23.24c
Granola	5.11b	1.59b	5.04bc	5.06c	94.80ab	92.62bc	24.45bc
Espirit	4.15c	2.35a	4.10c	7.70a	92.21b	90.22c	28.44ab

Means followed by the same letter in the same column do not differ significantly from each other at 5% level by DMRT

**Table 2.** Damage severity by potato cutworm at Munsigonj

Variety	Plant damage up to 40 days (%)	No. of hole/ damage tuber	Damage tuber (%)		Non-infested (%)		Yield (t/ha)
			Number	Weight	Number	Weight	
Diamant	1.62e	2.60a	4.17b	4.90b	95.88b	95.09b	27.24a
Cardinal	3.35d	2.58a	1.22c	1.21c	98.88a	95.00b	26.98a
Patrones	8.11a	1.62b	2.12c	3.00bc	97.70a	97.12ab	23.17b
Granola	6.60b	1.72b	1.20c	1.80c	98.68a	98.10a	22.26b
Espirit	5.00c	2.55a	5.22a	7.00a	94.55c	92.84c	25.77a

Means followed by the same letter in the same column do not differ significantly from each other at 5% level by DMRT

At Munsigonj, the lowest plant damage due to cutworm ranged (1.62-8.11) lowest damage was recorded in Diamant and it differed significantly with rest varieties (Table 2). Number of hole per damage tuber varied 1.62-2.60 with the minimum and the maximum, respectively Patrones and Diamant. The effect Diamant, Cardinal and Espirit in relation to number of hole per damage tuber were in significant. In variety Granola, percent of damage tuber number was lowest (1.20) followed by Cardinal and Petrones. These three varieties were statistically similar. Almost similar trend of the varieties were found when damage tuber by weight considered. In case of non-infested tuber by number, the minimum 94.55% was recorded in Espirit and differed significantly with rest varieties. Mmaximum yield was harvest from Diamont(27.24) followed by Cardinal(26.98) and Espirit(25.77) and they were statistically insignificant. Almost similar information was made by (Anon, 2009) in

this country. At Mymensingh, plant damage ranged 1.88-8.42%. The infestation was in Diamant and it differed significantly with rest of varieties.(Table 3). The lowest number of hole per damage tuber detected in Cardinal (1.40), followed by Granola ,Patrones Espirit and Diamant. Damage tuber number by percent ranged 6.11-17.00%. Significantly lower Percent damage tuber was recorded in Granola (6.11) and it differed significantly with all the rest varieties except Petrones. More or less similar statistical trend of the varieties was also observed in case percent of damage tuber by weight. Significantly higher percent of non-infested tuber number detected in Granola (93.88) and it showed statistically at pair with Patrones. In respect of yield, it ranged 22.44-26.25 t/h. The yield potentiality of the varieties may be arranged in order of descending as Diamont. Cardinal, Espirit, Granola and Patrones. Almost similar information was made by (Anon, 2009) in this country.

**Table 3.** Damage severity by potato cutworm at Mymensingh

Variety	Plant damage up to 40 days (%)	No. of hole/ damage tuber	Damage tuber (%)		Non-infested (%)		Yield (t/ha)
			Number	Weight	Number	Weight	
Diamant	1.88e	1.90a	17.00a	8.99a	82.85c	91.22c	26. 82a
Cardinal	3.14d	1.40c	15.10ab	9.52a	84.99bc	90.30d	26.25ab
Patrones	8.42a	1.50bc	10.40bc	7.77a	89.50ab	92.80b	22.44c
Granola	6.40b	1.42bc	6.11c	6.84a	93.88a	93.77a	22.70c
Espirit	5.10c	1.72ab	13.88ab	8.22a	86.44bc	91.10c	25.8b

Means followed by the same letter in the same column do not differ significantly from each other at 5% level by DMRT

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