

EFFECT OF VARIOUS INSECTICIDES FOR THE CONTROL OF POTATO CUTWORM (*Agrotis ipsilon* Huf., NOCTUIDAE: LEPIDOPTERA) AT KALAM SWAT.

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ABSTRACT

Studies were carried out on the management of potato cut worm, *Agrotis ipsilon*, through chemical insecticides; Steward (Indoxycarb), Linnate (Methomyl) and Poison Bait (Dipterex +Sugar + Rice husk) on permanent plots of potato crop at Kalam Swat, NWFP on private farm during 2002. The insecticides were applied at recommended doses, before the appearance of adult moths of black cut worm (*Agrotis ipsilon*) and then subsequent symptoms of the cutworm larvae in the potato plots. The data were collected by counting the number of damage plants or plant parts by potato cutworm at the interval of 2-days, 3days, 5 days and 12 days after treatment. The results showed that insecticides were non significant to each other but significantly different from control. Seasonal mean infestation was the highest (11.5%) in the check plot, while the lowest (1.3%) in poison bait followed by Lannate (1.6%) and then by steward (1.8%). Poison bait application is laborious but still effective and comparatively safe, it is, there for, suggested it could be incorporated in the IPM of potato for minimum and target use of pesticide.

INTRODUCTION

Potato crop is attacked and damaged by a number of insect pests including wireworms, white grub, aphids, cutworm and others as a result, the yield of the crop is adversely affected. Cutworms and Potato – peach aphid are the two devastating insect pest in the spring crop (Sing 2002). Cutworm is a polyphagous pest. Larvae of cutworm can damage 30 cultivated and 20 wild species of plants but the greatest damage was observed on Tobacco, Potato, maize, beet and vegetable crop (NicoLova 1971).

Its attack on tobacco, potato, tomato, bottle gourd, lady's finger, cabbage, sugar beat, turnips, grams and many ornamental plants, at different times of the year and at different localities was also recorded by Khan (1976).

The full grown larvae of the cutworm are dark or dark brown in colour with greasy body. The adult female cutworm lays their eggs on the grasses or on the weeds. The larva on emergence feeds on the epidermis of the leaves, biting the stems of seedling, eating the leaves and sometime the entire seedling and their habit changes according to their growth. Cutworm is nocturnal as it attacks the young seedling of the plants at night. They feed on the plants by cutting their stem either below or just above the ground level. The larvae of cutworm hide and live inside the cracks and holes in the soil during the day. The percent damage caused by it varies from 20-37 % but in severe cases the damage occur as much as 80% depending on the severity of infestation (Atwal, 1976). The current study was carried out to find out

the best management strategies for this obnoxious insect pest of the spring potato crop at Kalam, Swat.

Lannate-40 WP is widely used in the area against the pest while Steward 150-SC is introduced to replace the old product. The experts on the potato-IPM are against both the products and are looking for safer and cheaper alternatives. The current study was carried out to find the efficacy of Poison bait against the cutworm in the spring potato.

MATERIALS AND METHODS

An experiment was conducted to evaluate the efficacy of Poison Bait in comparison with Lannate and Steward against potato cut worm, *Agrotis ipsilon*, on potato crop at Kalam, Swat during 2004.

Four treatments i.e., Lannate 40 SP, Steward 150 EC, and Poison Bait (having Dipterex 95 SP) and a check were evaluated (Table-1). All the treatments were replicated three times. Each treatment and replication was separated by keeping a one meter buffer zone. Experimental unite was of 20 m² having 120 plants per plot grown in the rows (ridges) made in each plot. Insecticides were applied after emergence of the seedling and upon the appearance of symptoms of cutworms in the field, at their recommended doses given in table-1. Lannate and Steward was applied as a foliar application through Knapsack sprayer, while the poison bait was prepared by mixing the ingredients and were applied manually by putting it near the stem of seedling above the surface of soil.

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Table I Treatments detail and their doses per acre

S. No	Insecticides (tread name)	Conman name	Dose
1	Poison Bait	Trichlorfon	(Husk5kg+Sugar200g+Depterex 95 SP, 25g + water)
2	Steward-150 SC	Indoxycarb	175ml/acre
3	Lannate-40 WP	Methomyl	300g/acre
4	Control	-	Nil

Data were recorded in each plot by counting the number of damaged plants or plant parts by potato cutworm and the data were collected at the interval of 2-days, 3days, 5 days and 12 days after the application of the treatments.

Completely Randomized Design was used for the experiment. F-test was applied for data analyses and the means were compared by using least significant differences (LSD) test by using the procedures of Steel and Torrie (1980).

RESULTS AND DISCUSSION

Efficacy of Poison Bait (Dipterex) along with Lannate and Steward was evaluated for the management of the cut worm (*A. ipsilon*) on potato crop at Kalam, Swat. Pre-treatment observations for all the plots were recorded and found non-significant. Data obtained on percent infestation presented in Table-II, and the effect of the insecticides application were found statistically significant ($P<0.05$) as compared to control but non-significant to each other.

Table II Percent damage plants by cutworm larvae in response to various treatments

S.No	Treatment	Damaged plants (%)				
		2-days	3-days	5-days	12-days	Seasonal means
1	Poison Bait	2.00 a	1.66 a	1.00 a	0.66 a	1.33 a
2	Steward	2.33 a	2.00 a	1.66 a	1.00 a	1.75 a
3	Lannate	1.33 a	2.00 a	1.66 a	1.33 a	1.58 a
4	Control	11.60 b	14.00 b	12.00 b	8.33 b	11.48 b

Means followed by same letters are not significantly different at 5% level of significance.

Treatment effect was statistically significant ($P<0.05$) for all the intervals (2-days, 3-days, 5-days and 12-days). Percent plants damaged were reduced due to insecticides application, the highest been recorded in

control were 11.6, 14.0, 12.0, and 8.3%, while the lowest were recorded for the plots treated with Poison Bait (2.0, 1.6, 1.0, and 0.66%) for 2-days, 3-days, 5-days and 12-days, respectively (Table-II).

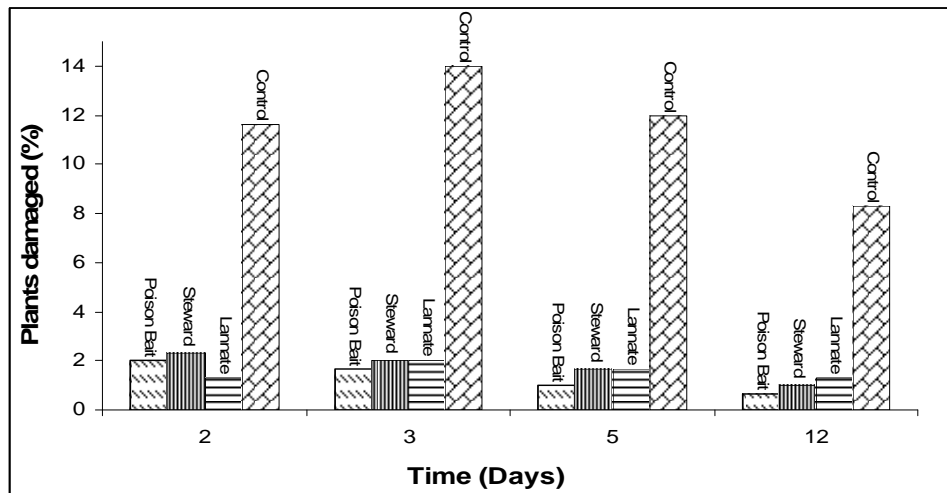


Fig-1: Percent damage plants by cutworm larvae in response to various treatments

The lowest mean Percent plants damaged for the whole season was observed in the Plots treated with Poison bait (1.33%) followed by Lannate and then Steward as compared to the check plot (11.48%), (Fig-2). It showed that the Poison Bait can be a better competitor for the management of potato cut worm as compared with the two insecticides

In the present study no significant difference was observed between the effectiveness of the Steward and Lannate which ranked next to Poison Bait in effectiveness. The results were in agreement to Malik (1978), Suss (1978) and Chang (1984), who reported effectiveness of various insecticides against *Agrotis ipsilon*. The pest is destructive at early stage so one time spray application was good enough to control *Agrotis ipsilon*. Effectiveness of a single application was also supported by Harris and Suec (1973), Khan *et al.* (1974) and Aslam *et al.* (1980) who used different insecticides in their studies for the *Agrotis ipsilon* control with single application of insecticides.

Malik (1978) tested seven insecticides for the control of *Agrotis ipsilon* and achieved significant control of the pests in all the treated plots as compared to untreated plots. Relatively better results were obtained with Dipterex 80SP, Agrotix and Hostathion.

Insect attractants with poisons (insecticides) is a practice that has been used in pest management for many years. In the early 1900s, for example, poisoned bran baits were used for grasshopper control. Hoppers attracted to the treated bran and fed on it were killed by an insecticide that could not be applied safely, economically, or effectively in any other manner. Insecticidal baits are being used currently in the control of several pests including the house fly, slugs, certain ants, cockroaches, and yellow jackets.

CONCLUSION AND RECOMMENDATION

It can be concluded that Poison bait is more effective than the other two treatments. Poison baits are applied only to specific and target location in the potato fields as well as minimum quantity of pesticide (Dipterex) was used and it has also having minimum chances of pesticides carry over, so keeping in view the above merits of poison bait, it is recommended that it should be used for the management of potato cutworm (*Agrotis ipsilon*). It is suggested that the timing of the application of the insecticides is important and the most appropriate time for the cut worm is immediately after the first evidence of the cut worm damage in the potato field.

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