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EFFICACY OF DIFFERENT OIL CAKES AGAINST POTATO CUTWORM, AGROTIS IPSILON (HUFN) IN BIHAR (INDIA)

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ABSTRACT

Potato is an ideal crop because of its virtue like wide adaptability, flexibility of production, diverse range of human taste and preference. Potato tuber contains about 80% water and 20% dry matter. The dry matter contains starch, sucrose, crude protein, pure protein, ascorbic acid, potassium & phosphorus. Potato is attacked by more than 100 arthropod pests. Of these, more than 80 have been reported in India. Potato cutworm, Agrotis ipsilon has been observed a serious pest of potato in Bihar. The efficacy of oilcakes of five plants like Neem, Mahua, Casor, Mustard and Karanj was studied at Muzaffarpur (Bihar). The foliar damage was recorded between 0.80 to 1.90% in different treatment of cakes as compared to 5.90% in untreated plots. The tuber damage by number varied between 2.40 to 3.40% in different treated plots as compared to 10.60% in untreated plots. The tuber damage by weight varied between 2.60% to 3.50% in different treated plots as compared to 11.30% in untreated plots. Among these treatments, Neem cake was found most effective as in this treatment foliar damage was 0.80%, tuber damage by number was 2.40% and tuber damage by weight was 2.60%.

KEYWORDS: Potato, Pest, Infestation, Cutworm, Oilcake, Agrotis ipsilon.

INTRODUCTION

Potato (Solanum tuberosum) is an important crop of India. Potato is thought to have been originated in South America, where it was probably the most productive source of food for the communities of the High Andes and southern chile for many centuries. By early 19th century, potato established itself as an important vegetable crop in hills and plains of India. Detailed studies of Indian potato varieties by Pushkarnath (1976) recognized sixteen distinct locally established or desi varieties. In India, the major production area of potato (about 74%)

is located in three states namely Bihar, U.P. and West Bengal. The other important states are Assam, Punjab, Karnataka and M.P. Potato is attacked by more than 100 pests of Arthropods, of these more than 80 have been recorded in India. Out of various insect pests of potato, Agrotis ipsilon (Potato cutworm) is very destructive in Bihar. For controlling insect pests, different types of chemical insecticides are used. Abundant use of chemical insecticides leads to concentration of chemicals which ultimately affect the ecosystem. Integrated pest management is a better and safe alternative to these chemical pesticides. Some plant extracts may be used as biopesticides to control insect pests. According to Singh et al. (2001), today about 200 plants with insecticidal property are known. Plant derived pesticides offer a more natural and ecofriendly approach to pest control than synthetic insecticides (Leatemia and Isman, 2004). According to Harikrishnan et al (2003), among the natural products, one of the most promising natural compound is Azadirachtin, an active compound extracted from the Azadirachta indica, whose antiviral, antifungal, antibacterial and insecticidal properties have been known for several years. In the present investigation, five types of oil cakes – Neem cake, Mahua Cake, Castor, cake, Mustard cake and Karanj cake were used to control the infestation of potato by Agrotis ipsilon. The investigation was carried out in Muzaffarpur (Bihar) during the year 2013–14.

MATERIALS AND METHODS

A field trial was conducted in randomized block design with five different cakes namely Neem cake, Mahua cake, Castor cake, Mustard cake and Karanj cake and replicated four times in the farmer's field at Muzaffarpur (Bihar) during 2013–2014. The Kufri Sinduri variety of potato was planted in first week of November, 2013 in plot size 4.25 x 4m^2 and spacing 60 x 20 cms. All the agronomical practices were done as per schedule. Weekly observations were recorded on the incidence of A. ipsilon on plant foliage. At harvest, damage of tubers due to cutworm both by number and weight basis was recorded.

RESULTS

Results obtained are summarized in Table–1 and Figure–1. From the data of the table, it is evident that the foliage damage was recorded between 0.80 and 1.90% in different treatments as compared to 5.9% in T6 (Untreated). T1 (Neem cake) was most effective (1.20%) followed by Mahua Cake (1.50%). The tuber damage (by number) varied between 2.40 to 3.40% in different treated plots as compared to 10.60% in T6 (untreated). T1 (Neem cake) was most effective (2.40%) followed by Mahua cake (3.20%). The tuber damage (by weight)

recorded between 2.60 to 3.50% in different treated plots as compared to 11.3% in T6 (untreated). T1 (Neem cake) was most effective (2.60%) followed by Mahua cake (3.10%). All treatments gave better response in comparison to control (untreated).

Table: 1. Efficacy of different oil caked against potato cutworm, Agrotis ipsilon HUFN

Treatments	Dosage/ha	Average % foliage damage	Average % Tuber damage	
			By number	By weight
T1 – (Azadirachta india) Neem cake	2.5 ql.	0.80	2.40	2.60
T2 – (Madhuka indica) Mahua Cake	2.5 ql.	1.20	3.20	3.10
T3 – (Ricinus communis) Castor Cake	2.5 ql.	1.50	3.25	3.20
T4 – (Brassica Juncea) Mustard cake	2.5 ql.	1.90	3.30	3.40
T5 – (Milletia pinnata) Karanj cake	2.5 ql.	1.60	3.40	3.50
T6 – control (untreated)	–	5.90	10.60	11.30

ha – hectare

ql = quintal

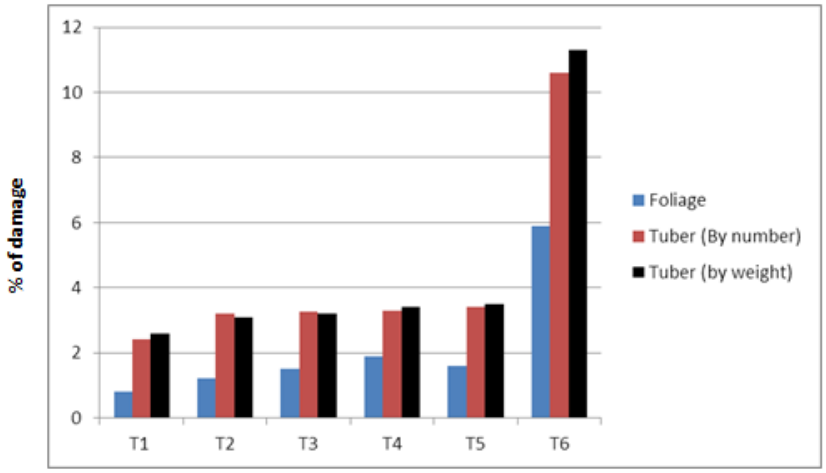

FIGURE: 1 Efficacy of different oil cakes against potato cutworm, Agrotis ipsilon HUFN

T1 – Neem cake

T2 – Mahua cake

T3 – Castor cake

T4 – Mustard cake

T5 – Karanj cake

T6 – Control

DISCUSSION

According to simpson (1977) more than 100 Arthropod pests damage potato crop in various regions of the world. Mishra and Agrawal (1988) have given a comprehensive list of insect and non insect pests damaging potato in different parts of India. Kumar and Kumar (2005) reported Agrotis ipsilon as a serious pest of potato in Bihar. Gulab Ram et al (2001) reported that Kufri chandramukhi variety of potato suffered maximum foliage as well as tuber damage by Agrotis ipsilon. Kumar and Tiwary (2009) reported that Kufri Chandramukhi variety of potato suffered maximum foliage as well as tuber damage (by number and weight both) by Agrotis ipsilon, in Muzaffarpur (Bihar). Shanmugapriyan and Dhanalakshmi (2015) reported that Neem cake extract, Neem seed kernl extract and Neem oil were effective against the insect pest Henosepilachna vigintioctopunctata on bittergourd. According to Radha (2013), higher concentration of neem seed kernel extract (6.0 %) reduced the percentage of the adult emergence of cowpea aphid, Aphis craccivora (Koch). Kumar and Trivedi (2014) reported that application of neem oil cake minimized the infestation of litchi fruits by platypepla illepida Mayr. According to Anuradha and Annadurai (2008) Azadirachtin is active insecticide in about 550 insect species. Salaka (2002) reported that Neem was effective against various insect pests of wheat, Barley, Paddy, Sugarcane, Tomatoes, Cotton etc.

According to the result of present investigation, it was evident that application of Neem cake reduced maximum infestation of potato by Agrotis ipsilon as compared to other cakes like Mahua, Castor, Mustard and Karanj. Under the treatment by Neem cake the foliage damage was only 0.80% and tuber damage by number and by weight was recorded 2.40% and 2.60% respectively.

CONCLUSION

On the basis of the findings, it may be concluded that application of Neem cake (2.5 ql/ha) minimized potato infestation (foliage & tuber both) by Agrotis ipsilon.

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