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Susceptibility of Different Varieties of Mango to Leaf Cutting Weevil, *Deporaus marginatus* P. and its Control

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Abstract: The experiments were conducted on 12 mango graft varieties/cultivars viz. BARI mango-1, BARI mango-2, BARI mango-3 (Amrapali), Fazli, Gopalbhog, Khirsapat, Kazla sinduri, Kazla-01 (Subarna), Langra, Mallika, Rad and seedling (stock plant) on the incidence of mango leaf cutting weevil (*Deporaus marginatus* P.), its extent of damage to mango leaves and the effectiveness of non-chemical and chemical (insecticide) for control. The highest infestation of 52.55% leaves recorded in BARI mango-3 (Amrapali) followed by Rad, Mallika, BARI mango-1 and BARI mango-2 and the lowest infestation of 13.78 and 18.55% found in Langra and Gopalbhog followed by Kazla-01 and Khirsapath. The other three varieties sustained 27.49-30.64 % leaf damage. To control the mango leaf cutting weevil bagging with mosquito net and bagging with polythin bag had the best performance with 100% reduction of leaf infestation followed by spraying of Ripcord. Spraying of Decis caused 82.23 % reduction of leaf damage followed by Sevin, Azodrin and Diazinon with the least control efficiency of Sumithion.

Key words: Susceptibility, mango leaf cutting weevil, control.

Introduction

Mango, (*Mangifera indica* L), the king of fruits, is one of the ancient fruits of Indian origin. It is the most important and delicious fruit commercially grown in Bangladesh. A large number of insect pests cause a considerable damage to the mango trees as well as fruits. There have been over 175 species of insects damaging mango trees (Vevai, 1969; Nayar *et al.*, 1976). Only a handful of these insects are of major importance and others are minor. Among the pests mango leaf cutting weevil (*Deporaus marginatus*) is considered as major pest (Hill, 1983) which causes extensive damage to the foliage. Mango leaf cutting weevil is found all over India, Bangladesh and Burma, and it is a specific pest of mango (Butani, 1979). The weevil attacks the new flushes of leaves and destroy them completely leaving only the stems. Young trees suffer more than the older ones. The female excavates small cavities on either side of the mid ribs on lower surfaces of tender pinkish leaves which are then cut by the weevils near the base. The leaf drops on the ground. The shoots are defoliated, lose vigor and get weakened. It is prime need to manage this pest properly. The present study was undertaken to assess the damages onto the leaves of different mango varieties by *D. marginatus* and its control.

Materials and Methods

The field experiments were conducted to study the

varietal susceptibility of mango to leaf cutting weevil (*Deporaus marginatus* P) and its control at Fruit Research Station, Binodpur, Rajshahi, Bangladesh during January-May, 2002. One year old of mango graft of 12 varieties/cultivars including seedling (stock plant) such as BARI mango-1, BARI mango-2, BARI mango-3 (Amrapali), Fazli, Gopalbhog, Kazlasinduri, Kazla-01 (Subarna), Khirsapat, Langra, Mallika, Rad and Seedling (stock plant) were examined to record the degrees of infestation of leaf cutting weevil. The first experiment was conducted in Randomized Complete Block Design with twelve varieties/cultivars/lines as treatments with three replicates. Ten graft trees considered as one replicate. The entire leaves per plant consisting mature and young leaves were examined and counted, and the infestation of *Deporaus marginatus* to the new leaves was recorded. The incidence of mango leaf cutting weevil in terms of per cent infested leaves was obtained.

Another field experiment was laid out in a Randomized Complete Block Design with three replicates on mango variety BARI mango 3 (Amrapali), five graft trees treated as a replicate. There were nine treatments such as spraying of Ripcord 10 EC, Decis 2.5EC @ 1ml l⁻¹, Azodrin 40 WSC, Diazinon 60EC, Sumithion 50EC @ 2 ml l⁻¹, Sevin 85 WP @ 2g l⁻¹, Bagging by mosquito net and Bagging by polythin bag (perforated) and untreated control. In a nursery 15 graft trees with new flashes of leaves were selected and tagged the new leaves for each

control treatment. Then all the control approaches were applied. After 10 days the tagged leaves were counted for recording data of healthy and infested leaves and percentage of infestation was calculated. The data in respect of the percentage of leaf infestation of 12 mango varieties and the percentage of reduction of leaf cutting as effects of treatments for control of this insect were analyzed in ANOVA through MSTAT program.

Results and Discussion

Infestation of mango leaf cutting weevil: A graft tree contained 40.36 to 75.43 leaves in total including 9.60 to 23.46 young leaves which were infested by leaf cutting weevil (Table 1). The percentage of leaf infestation differed significantly ($p < 0.01$) among the varieties. The *Deporaus marginatus* infested the highest of 52.55% leaves in BARI mango-3 (Amrapali) followed by Rad, Mallika, BARI mango-1 and BARI mango-2. The lowest infestation of 13.78% was recorded in Langra which was identical to Gopalbhog and followed by Kazla-01 and Khirsapat. The remaining other three varieties showed the moderate infestation. Varietal susceptibility might be due to cultivar specific trait. Rafiquzzaman *et al.* (1999) conducted an experiment with 10 mango cultivars in India and all of them were susceptible to mango leaf cutting weevil with Amrapali as the most susceptible variety

having 53.9 and 57.4% leaf infestation in 1995 and 1996 respectively and Sorikhus the least susceptible cultivar with 33.17 and 39.8% leaf infestation. Results revealed that more or less one third of the total leaves represented by the young leaves were liable to the attack of *Deporaus marginatus*.

Control approaches: The application of different control approaches significantly reduced the leaf infestation ($P < 0.01$) compared to control (Table 2). There was no infestation of the insect in the mango grafts treated with bagging of mosquito net as well as polythin bag followed by Ripcord treatment. The reduction of 82.23% leaf infestation due to treatment with Decis was followed by Sevin, Azodrin and Diazinon treatments. The untreated mango grafts showed 57.41% leaf infestation by *Deporaus marginatus* followed by Sumithion treatment. The non-chemical control approaches like bagging with mosquito net and polythin bag recorded superior performance along with Ripcord application on the reduction of leaf damage by *Deporaus marginatus*. On the other hand Decis, Azodrin, Sevin and Diazinon provided control of leaf damage next to above three treatments. Spraying of Sumithion did not inflict the control of leaf infestation as other insecticides and non-chemical approaches. Rafiquzzaman and Maiti (1998)

Table 1: Percentage of infestation of leaf in different varieties or lines of mango by Leaf cutting weevil (*Deporaus marginatus*.)

Varieties/cultivars	Mean no. of total leaves/graft tree	Mean no. of new leaves/graft tree	Leaf infestation (%)
BARI mango-3 (Amrapaly)	51.38	16.70	52.55 (46.46) a
Mallika	62.53	23.46	44.60 (41.85) ab
Fazli	40.36	14.00	28.58 (32.22) bcd
BARI mango-1	59.43	16.36	40.73 (39.58) abc
Kazla Sinduri	47.30	16.40	30.64 (33.42) bcd
BARI mango-2	46.36	12.83	39.11 (38.59) abc
Khirsapat	57.63	16.90	23.03 (28.56)cd
Langra	64.36	20.56	13.78 (21.67)d
Gopalbhog	70.20	23.56	18.55(25.32) d
Kazla-01(Subarna)	57.23	20.23	22.93 (28.56)cd
Rad	75.43	17.33	46.16(42.41) ab
Seedling (Stock plant)	44.03	9.60	27.49 (30.70)bcd
CV (%)			19.47

Figures in the parenthesis indicate ArcSin transformed values. Means having same letter(s) did not differ significantly.

Table 2: Efficacy of different control approaches against mango leaf cutting weevil.

Treatment	Dose (ml or g l ⁻¹)	Percent infestation (mean)	Infestation reduction over control (%)
Ripcord	1	7.55 (15.75) cd	86.84
Decis	1	10.20 (19.21) c	82.23
Sevin	2	16.86 (23.84) bc	70.63
Azodrin	2	25.13 (29.81) bc	56.22
Diazinon	2	26.30 (30.54) bc	54.18
Sumithion	2	33.63 (35.30) ab	41.42
Bagging by mosquito net	-	0.0 (0.81) d	100.0
Bagging by polythin bag	-	0.0 (0.81) d	100.0
Control	-	57.41(49.41) a	-
CV (%)		26.60	

Figures in the parenthesis indicate ArcSin transformed values. Means having same letter(s) did not differ significantly.

worked on toxicity of four insecticide to adults of the mango leaf cutting weevil with the order of efficacy as Cypermethrin > Quinalphos > Carbaryl > Dichlorovos. Soh and Khoo (1983) on field evaluation of four insecticides for the control of the mango leaf cutting weevil in Selangor, west Malaysia found Deltamethrin applied at 0.0022% toxicant as the most effective compound against *Deporaus marginatus*.

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