

Assessment of Cane Damage caused by Rootstock borer *Emmalocera depressella* Swinhoe and effects of Pesticides on the Pest

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ABSTRACT

Experiments were conducted to assess the damage caused by rootstock borer, where Dieldrin 20EC and Furadan 3G were tested to record their effects on the pest. Infestation in March can kill the whole plant and when a mature cane is infested weight is reduced. Rootstock borer reduced yield of cane by 8.55%. Results show that Dieldrin 20EC @ 1.5 kg a.i./ha & 2.0 kg a.i./ha significantly reduced infestation. Untreated plot had 68% infested plants compared to 34.59% and 37.40% in Dieldrin treated plots @ 1.5 kg a.i./ha and 2.0 kg a.i./ha respectively. Furadan had no significant effect on per cent infestation. But both Dieldrin and Furadan @ 2.0 kg a.i./ha significantly reduced the population of alive larvae in the stubble.

INTRODUCTION

Rootstock borer (RSB) is one of the most destructive pest of sugarcane. Large scale infestation at the early stage of the crop may cause gaps in the field with resultant yield loss. In severe cases the pest can cause havoc by infestation of 100% cane leading to drying of immature and mature cane (Personal observation).

Very little work has so far been done in Bangladesh on chemical control of this pest. A preliminary test of Furadan 3G showed that the chemical might control RSB if applied earlier in the season or when the RSB infestation just begins (SRTI Annual Report, 1981). Spraying 0.02% Endrin @ 100 gallons per acre can also be helpful during pre-monsoon period when root borer eggs are about to hatch (Butani, 1961). Gupta (1959) described that application of gamma BHC (1.00%) at 1 lb actual per acre sprayed over the setts at the time of planting considerably reduces the RSB incidence. Spraying with Endrin at 0.1 per cent emulsion have shown promise also in reducing the incidence of the rootstock borer. But the nature of attack dictates that application of any contact poison over the setts applied during plantation will not be helpful in controlling this pest. Therefore, an experiment was conducted to contaminate the soil surface with Dieldrin 20EC around the base of the plants and compared to Furadan 3G a systemic insecticide.

MATERIALS AND METHODS

The experiment was conducted at SRTI farm during 1984-85 cropping season. It was laid out in a randomized block design with seven treatments and three replications. The variety was ISD-16. The plot was 8m x 12m with one meter gap between two plots of the same block and one buffer row between two blocks. All normal cultural practices except RSB control were done.

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For this experiment Furadan 3G and Dieldrin 20EC were selected each with three doses @ 1.0, 1.5 & 2.0 kg a.i./ha and a control.

Furadan 3G was applied by broadcasting the required quantity in furrows made both side of the cane rows and was covered with a thin layer of soil. Dieldrin was applied by drenching the base of plants with the help of a modified pesticide applicator developed at SRTI (Miah, 1980). Both the insecticides were applied in May, 1985.

Data were collected by uprooting 20 stools per plot and the number of millable and infested (RSB) canes were counted from these stools in December, 1985. Weight of infested and healthy cane was recorded. Uprooting of stubbles from three lines (8m long) of each plot was done and the number of live larvae were counted.

RESULTS AND DISCUSSION

The effects of Furadan 3G and Dieldrin 20EC on the different parameters varied with doses. Percentage of RSB infestation (Table 1) : Dieldrin 20EC @ 1.5 kg a.i./ha and 2.0 kg a.i./ha significantly reduced infestation. Untreated plot had 68% infested plants compared to 34.59% and 37.40% in dieldrin treated plots @ 1.50 kg a.i./ha & 2.0 kg a.i./ha respectively. Furadan had no significant effect on percent infestation.

Cane weight (Table 1) : RSB reduced cane yield by 8.55%. Infestation in March can kill the whole plant. When a mature cane is infested, weight of millable cane is reduced.

Table 1. Percentage of RSB infestation and weight of healthy and infested millable cane from twenty uprooted stools per plot at harvest.

Treatments	Infestation %	Weight of 100 healthy millable cane (kg)	Weight of 100 infested millable cane (kg)
1. Furadan 3G @ 1.0 kg a.i./ha	54.44 ab*	124.90 a	79.63 a
2. Furadan 3G @ 1.5 kg a.i./ha	64.73 b	153.90 a	94.60 a
3. Furadan 3G @ 2.0 kg a.i./ha	68.08 b	133.50 a	108.60 a
4. Dieldrin 20EC @ 1.0 kg a.i./ha	45.60 ab	119.56 a	98.22 a
5. Dieldrin 20EC @ 1.5 kg a.i./ha	34.59 a	121.00 a	100.56 a
6. Dieldrin 20EC @ 2.0 kg a.i./ha	37.40 a	117.26 a	107.40 a
7. Control	68.00 b	116.99 a	106.52 a

* Figures in columns accompanied by similar letters do not differ significantly at 0.05 level as per DNMR test

The yield of treated infestation-free cane increased to some extent but was not significant. But this increase in weight is a kind of bonus by reducing RSB infestation following pesticide application. Considering the weight of 100 RSB free cane of 116.99 kg and 137.43 kg in untreated and treated crop respectively a yield increase of 17.47% $(137.43 - 116.99 \times 100) / 116.99$ is achieved in addition to saving of 8.55% loss amounting to total gain of about 26.02% $(8.55 + 17.47)$ if Furadan 3G is applied in May to control RSB in a farm where other soil pests are not causing problem. Similarly by using

Dieldrin 20EC a total gain of 10.49% additional yield was obtained on the same type of soil.

Furadan 3G had no significant effect on infestation but percent yield increase (extra yield) in Furadan treated plot was nearly 2.48 times higher than dieldrin treated plot. It may be due to the fact that root promoting substance in Furadan caused increased root development through increased mitotic index (Miah and Akhter, 1985) thereby resulting in increased nutrient absorption and better yield.

Larval population after the harvest : Untreated stubbles had 29.05 live larvae on an average whereas treated stubbles had almost half the population of live larvae (Table 2). It is worth mentionable that Furadan 3G did not affect infestation (%), but reduced the population of live larvae. The cause is not quite clear but apprehended that Furadan enhanced uptake of potassium (Venugopal and Litsinger, 1980) enhancing resistance of the plants manifested through antibiosis.

Table 2. Number of alive larvae in stubbles from three lines per plot at harvest.

Treatments	No. of alive larvae (Average of 3 replicates)	Transformed
1. Furadan 3G @ 1.0 kg a.i./ha	20.52	4.53 ab*
2. Furadan 3G @ 1.5 kg a.i./ha	17.31	4.16 a
3. Furadan 3G @ 2.0 kg a.i./ha	14.67	3.83 a
4. Dieldrin 20EC @ 1.0 kg a.i./ha	17.14	4.14 a
5. Dieldrin 20EC @ 1.5 kg a.i./ha	19.36	4.40 ab
6. Dieldrin 20EC @ 2.0 kg a.i./ha	15.84	3.98 a
7. Control	29.05	5.39 b

* Figures in columns accompanied by similar letter(s) do not differ significantly at 0.05 level as per DNMR test.

This work indicate that the pesticides discussed above may have a promise in controlling rootstock borer economically if applied at the dose of 2.0 kg a.i./ha. However, better success may be anticipated if the pesticides are applied after thorough monitoring, preferably in the generation prior to the one available in May. Further work in this connection is required to find out precise time, dose and method of application for rootstock borer control.

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