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Control of Sugarcane Shoot Borer *Chilo infuscatellus* Snellen with Granulosis Virus and Cultural Practices

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ABSTRACT

A field experiment was conducted during 1991-92 crop season at Sathiamangalam, Periyar district, Tamil Nadu, on the control of sugarcane shoot borer, *Chilo infuscatellus* using granulosis virus (GV) and cultural methods of control. The shoot borer infestation was significantly less in plots treated with GV and plots treated with GV+ cultural practices, than in control. Application of GV at 10^7 inclusion bodies/ml on 35 and 50 days after planting significantly reduced the shoot borer infestation compared to other treatments. All the treatments gave increased cane yield over control. The GV treatment alone resulted in a cost benefit ratio of 1:2.54 whereas it was 1:2.47 for trash mulching, 1:2.46 for GV application and 1:2.43 for GV+ earthing up.

KEY WORDS : *Chilo infuscatellus*, control, granulosis virus, cultural practices

The shoot borer *Chilo infuscatellus* Snellen is a widely distributed serious pest in early stages of sugarcane growth (Avasthy and Tiwari, 1986). The pest infestation reduces cane population and yield (Gupta, 1959) and sugar recovery (Patil and Hapase, 1981). A granulosis virus (GV) was reported from *C. infuscatellus* (Easwaramoorthy and David, 1979) which is highly pathogenic and widely distributed in Tamil Nadu and Pondicherry (Easwaramoorthy, 1984). Two to three rounds of light earthing - up during the early stages of crop growth (Gupta, 1945; Basheer *et al.*, 1954) and trash mulching (Parathasarathy, 1959; Rajani, 1966) are reported to control sugarcane shoot borer. Granulosis virus was evaluated individually and with cultural methods and the results on the control of shoot borer are presented.

MATERIALS AND METHODS

An experiment was conducted with the sugarcane variety Co.62175 in a farmer's field at Sathiamangalam, Periyar District, Tamil Nadu, during 1991-92, under randomized block design with seven treatments and three replications with a plot size of 80 m^2 (Table.1). Mass multiplication and purification of virus was according to Easwaramoorthy and Santhalakshmi (1988). The virus was applied at the rate of 500 l spray fluid per ha with 0.05 per cent teepol in all the treatments. Counts of dead hearts and total number of shoots were made five times at 15 days interval from 35 days after planting (DAP) onwards in each plot. The data over the periods were pooled and transformed to arc sine x $\sqrt{per\ cent}$ for further analysis. At harvest, cane yield was recorded and cost benefit ratio was worked out.

RESULTS AND DISCUSSION

The results showed that shoot borer damage was significantly less in GV 10^7 inclusion bodies (IB/ml) applied on 35 and 50 DAP which was superior to all other treatments. Next in order were trash mulching and GV 10^7 IB/ml applied on 35 DAP and GV application on 35 DAP followed by an earthing up which were on par with each other. Control plot recorded the highest damage of 38.7 per cent.

Table 1. Efficacy of GV and cultural practices in the management of sugarcane shoot borer

Treatment	Mean % dead hearts	Plot yield (kg) ($80\ m^2$)	Cane yield t/ha	Market value @ Rs. 380/t	Net gain over un-treated check (Rs.)	Cost of cultivation Rs./ha	Cost : Benefit
GV alone 10^7 IB/ml 30 and 50 DAP	8.8[a]	1104[a]	138.0	52440	4902	20650	1:2.54
Trash mulching 15DAP + GV 10^7 IB/ml on 35 DAP	12.8[b]	1097[a]	137.1	52098	4560	21075	1:2.47
GV 10^7 IB/ml on 35 DAP + Earthing up on 45 DAP	13.2[b]	1079[ab]	134.9	51262	3724	21075	1:2.43
GV 10^7 IB/ml on 35 DAP	15.2[c]	1053[bc]	131.6	50008	2470	20325	1:2.46
Trash mulching on 35 DAP	16.4[c]	1051[bc]	131.4	49932	2394	20750	1:2.41
Earthing up on 45 DAP	22.0[d]	1033[c]	129.1	49058	1520	20750	1:2.36
Untreated check	38.7[e]	1001[d]	125.1	47538	--	-	-

Means followed by same letters are not different significantly (P=0.05) by L.S.D.

Cost of GV of *C.infuscatellus*	Rs. 250/ha/spray
Cost of earthing up	Rs. 750
Cost of trash mulching	Rs. 750
Application charge	Rs. 75/ha/spray

All the treatments gave increased cane yield over control. Application of GV 10^7 IB/ml on 35 and 50 DAP accounted for highest cane yield (1104 kg/plot) followed by trash mulching and GV 10^7 IB/ml on 35 DAP (1097 kg/plot) and next in order was GV on 35 DAP and earthing up (1079 kg/plot). All the three were on par with one another. The cost benefit ratio from these plots were 1:2.54, 1:2.47 and 1:2.43, respectively indicating the effectiveness of GV treatments and cultural methods.

The differences in the cane yield in plots treated with virus alone and virus and cultural practices were not significant, though the shoot borer infestation was significantly different in plots treated with GV 10^7 IB/ml on 35 and 50 DAP. Hence single application of GV and cultural practices, such as either trash mulching or earthing - up may be sufficient for the control of sugarcane shoot borer. Parameswaran *et al., (1991) reported that spraying two rounds of GV (10^7* IB/ml) on 35 and 50 DAP was effective in checking shoot borer damage and increasing cane yield.

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