

CONTROL OF *HELOPELTIS ANTONII* SIGNORET INFESTING CASHEW USING DUSTING POWDER FORMULATIONS OF SOME COMMON INSECTICIDES

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The mirid bug *Helopeltis antonii* Signoret (Heteroptera: Miridae) is the most serious pest of cashew in Kerala, causing blossom blight and shoot damage. Abraham (1958) estimated the average damage due to pest infestation at 25% for shoots, 30% for panicles and 15% for tender nuts.

Damodaran and Nair (1969) reported that two sprayings of DDT 0.2%, carbaryl 0.1%, endrin 0.03% or dieldrin 0.05% at fifteen day's intervals commencing soon after the manifestation of the initial symptoms, were effective in controlling *H. antonii*. Insecticidal trials carried out at the Central Plantation Crops Research Institute, Kasargod revealed that endosulfan 0.05% applied as high volume spray or 0.1% as low volume spray at the periods of emergence of new flushes and panicles and at the time of fruit-set initiation was effective in controlling the pest (Pillai and Abraham, 1975).

Traditional cashew plantations in Kerala are mostly situated in hilly terrains. Acute water scarcity is experienced in such plantations during December-February and this is an important limiting factor in conducting spraying operations against the pest. The present experiment was therefore undertaken to evaluate the relative efficiency of dusting powder formulations of some of the commonly available insecticides in controlling *H. antonii*.

Materials and Methods

The field experiment was conducted at a Cashew Research Station, Madakkathara, Trichur during the period from October-February in 78-79, 80-81 and 81-82 adopting the randomised block design. There were six treatments including control (Table 1) each being replicated four times. Five year old seedling trees were selected at random for the experiment and a single tree constituted one treatment. Dusting powder formulations of the insecticides were applied using rotary duster by directing the discharge nozzle towards the canopy. Five hundred grammes of the dusting powder formulations were used for each tree.

The first round of dusting was given in October at the time of emergence of new flushes and the second round in the third week of November, synchronising with the flowering phase. The last round of dusting was given in the first week of January at the time of fruit-set initiation.

Twenty number of healthy shoots were selected at random from all segments of the canopy-spread, immediately prior to the first round of dusting and

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the extent of shoot damage after dusting was registered a fortnight later on a 0-4 scale as per the following norms:

0	:	No lesion/streak
1	:	One necrotic lesion
2	:	Two coalescing or non-coalescing lesions/streaks
3	:	Three coalescing or non-coalescing lesions/streaks
4	:	Lesions/streaks more than three and often confluent

For secondary panicle damage, twenty panicles were randomly selected from all sectors of the canopy-spread and the damage ratings were also recorded on a 0-4 scale based on the above norms.

The weighted mean scores from each treatment were analysed separately.

Results and Discussion

During the year 1978-79, the dusting powder formulations of carbaryl and phosalone were equally effective (Table 1) and superior to control and mercaptothion in reducing the shoot damage caused by *H. antonii*. But all the DP formulations were found to be ineffective in reducing damage to freshly emerged panicles and also to panicles beyond fruit-set initiation.

During the year 1980-81 (Table 2) phosalone, carbaryl and BHC were found to be on par and superior to mercaptothion and control in reducing shoot damage by the pest. As in the year 1978-79 no significant results were obtained in controlling panicle damage at the stage of panicle emergence and fruit-set initiation.

During the year 1981-82, the experiment was not found to be significant with regard to shoot damage and panicle damage beyond fruit-set initiation (Table 3) whereas the insecticides were found to be effective in reducing damage to freshly emerged panicles.

Analysis of pooled data (Table 4) revealed that the insecticides as dust formulations were effective only in controlling the shoot damage by *H. antonii*. They were ineffective in controlling damage to the panicles at emergence and also beyond fruit-set initiation. In respect of control of shoot damage, phosalone and carbaryl were found to be equally effective and superior to mercaptothion.

It has been reported that the populations of *H. antonii* show progressive increase commencing from September—October to February—March (Ambika and Abraham, 1979). The effectiveness of dust formulations in reducing shoot damage is perhaps explicable on the basis of the relatively low level of population of the pest at the time of emergence of fresh shoots. But during the flowering and fruit-set initiation stages the population of the insect would have increased considerably

Table 1

Relative efficiency of dusting powder formulation of some common insecticides in controlling *H. antonii* infesting cashew, 78-79

Treatments	Shoot damage (mean score values)	Panicle damage (mean score values)	
		Freshly emerged panicles	Beyond fruit-set initiation
Phosalone (Zolone 4%)	1.434	2.675	3.300
BHC (BHC 10%)	1.900	2.962	3.425
Mercaptothion (Cythion 10%)	2.325	3.212	3.687
Quinalphos (Ekalux 4%)	1.832	2.775	3.337
Carbaryl (Sevin 10%)	1.280	2.587	3.337
Control	2.175	3.037	3.675
C D (0.05)	0.46S	NS	NS

NS — Not significant

Table 2

Relative efficiency of DP formulation of some common insecticides in controlling *H. antonii* infesting cashew, 80-81

Treatments	Shoot damage (mean score values)	Panicle damage (mean score values)	
		Freshly emerged panicles	Beyond fruit-set initiation
Phosalone (Zolone 4%)	1.512	1.737	2.037
BHC (BHC 10%)	1.575	1.600	2.175
Mercaptothion (Cythion 10%)	1.875	2.025	2.550
Quinalphos (Ekalux 4%)	1.775	1.962	2.437
Carbaryl (Sevin 10%)	1.562	1.550	2.100
Control	2.275	2.162	2.675
CD (0.05)	0.269	NS	NS

NS = Not significant

Table 3

Relative efficiency of DP formulations of some common insecticides in controlling *H. antonii* infesting cashew, 81-82

Treatments	Shoot damage (mean score value)	Panicle damage (mean score value)	
		Freshly emerged panicle	Beyond fruit-set initiation
Phosalone (Zolone 4%)	1.600	1.862	2.362
BHC (BHC 10%)	8.712	2.087	2.537
Mercaptothion (Bythion 10%)	2.112	2.325	2.825
Quinalphos (Ekalux 10%)	1.637	1.937	2.475
Carbaryl (Sevin 10%)	1.875	1.900	2.512
Control	2.600	2.812	3.487
C. D. (0.05)	NS	0.766	NS

NS = Not significant

Table 4

Relative efficiency of DP formulation of some common insecticides in controlling *H. antonii* infesting cashew (Mean of pooled data for 78-79, 80-81 and 81-82)

Treatments	Shoot damage (mean score values)	Panicle damage (mean score value)	
		Freshly emerged panicle	Beyond fruit-set initiation
Phosalone (Zolone 4%)	1.515	2.091	2.563
BHC (BHC 10%)	1.729	2.216	2.712
Mercaptothion (Cythion 10%)	2.104	2.554	3.021
Quinalphos (Ekalux 10%)	1.748	2.225	2.749
Carbaryl (Sevin 10%)	1.572	2.012	2.649
Control	2.350	2.670	3.279
C. D. (0.05)	0.465	NS	NS

NS = Not significant

and the dust powder formulations of the insecticides were, therefore, ineffective in controlling large populations of the pest at later stages. The failure of the dust formulations to control panicle damage can also be explained on the basis of the unsatisfactory coverage of floral branches due to strong winds experienced during the period November—January and the consequential drift of insecticidal dust particles.

Summary

The relative efficiency of the dusting powder formulations of phosalone (Zolone 4%), BHC (BHC 10%), mercaptothion (Cythion 10%), quinalphos (Ekalux 4%) and carbaryl (Sevin 10%) against *Helopeltis antonii* S. (Heteroptera: Miridae) was evaluated in a field experiment conducted in the Cashew Research Station, Madakkathara, during October—February in 1978-79, 80-81 and 81-82. Three rounds of dusting were given, synchronising with the emergence of flushes, flowering and fruit initiation stages and the intensity of damage was scored on a 0-4 scale based on observations on twenty randomly selected shoots and panicles.

Dusting powder formulations of carbaryl, and phosalone were found equally effective and superior to mercaptothion in reducing shoot damage caused by *H. antonii*. None of the chemicals was effective in reducing damage to freshly emerged panicles and also the floral branches beyond fruit set initiation.

സംഗ്രഹം

കശുമാവിന്റെ ഇളം തളിരുകളേയും പൂങ്കുലകളേയും ബാധിക്കുന്ന തേയിലക്കൊതു കുകളെ (ഹെലോപെൽറ്റാറിസ് അന്റോണി) പൊടിരൂപത്തിലുള്ള കീടനാശിനികൾ ഉപയോഗിച്ച് നിയന്ത്രിക്കുന്നതു സംബന്ധിച്ച്, മാടക്കത്ര കശുമാവു ഗവേഷണ കേന്ദ്രത്തിൽ 1978-79, 1980-81, 1981-82 എന്നീ വർഷങ്ങളിൽ raft നടത്തിയ പരീക്ഷണങ്ങളിൽ ഫൊസാലോൺ (സോളോൺ), കാർബറിൽ (സെവിൻ) എന്നീ പൊടിരൂപങ്ങളും തളിരിടുന്ന സമയത്തെ ബാധ നിയന്ത്രിക്കുന്നതിന് ഫലപ്രദമാണെന്നു കാണുകയുണ്ടായി. എന്നാൽ, പൂങ്കുലകളിലെ കീടബാധ നിയന്ത്രിക്കുന്നതിന് പൊടിരൂപത്തിലുള്ള കീടനാശിനികൾ ഒന്നുംതന്നെ ഫലപ്രദമായിക്കണ്ടില്ല.

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