

COLLECTIVE MANAGEMENT OF BRINJAL SHOOT AND FRUIT BORER, *LEUCINODES ORBONALLIS* IN KUMAUN AND GARHWAL REGIONS

¹Dr. SHAHID SAMI SIDDIQUE, ²Dr. DEEP MALA

Department of Zoology
Government P.G. College,
Rudrapur U.S.Nagar Uttarakhand, India

Abstract: Among different IPM modules tested against shoot and fruit bore, *Leucinodes orbonallis* modules M4 using spinosad + Metarhizium anisoplae + Chelating agent Fe-EDTA+ cartap hydrochloride was found most effective causing minimum shoot infestation (7.47%) and fruit infestation of 23.21%, 21.09% and 23.60% at 4rd, 8th and 12th days after spraying respectively and giving highest yield (81.82q/ha).

Keywords: fruit and shoot borer, IPM brinjal, *Leucinode orbonallis*.

Brinjal of egg plant has wide spectrum of use for maintaining the human health and essentially a source for building economic trading for farmers. Between the numerous insect pests that invade brinjal crop. Shoot and fruit borer, *Leucinodes orbonallis* is most important, nexious and cosmopolitan pest triggering serious damage to shoots of sprout at vegetative stage and fruits at the times bearing until the harvest of fruits. The pest accounts for 44.11% and 55.40% for shoot infestation and 62.50% and 55.40% of fruit infestation of number and weight basis, respectively. Reported 48.30% losses in yield of brinjal fruits considering importance of the pest, different harmful chemical insecticides have been used, which has caused environmental pollution disturbing nature's balance, pest resurrection, residual toxicity and human health hazards However, one cannot avoid the use of chemical insecticides Therefore, it is necessary to use only safer, selective, economical and ecofriendly formulations We assessed different supervisor practices assimilating cultural, mechanical and microbiological constituents in different mixtures as modules to find an actual, economic and supportable management of *L. orbonallis*.

An experiment was conducted with a view to test the efficacy of different IPM modules against *L orbonallis* in Kharif, 2015-2016 in the field of Department of Entomology, Dr. Shahid sami siddique, Pant seed was sown by using randomized block designing and replicated four times with a spacing of 60 x 60 cm. There were six IPM modules tested along with controls (Table) Evaluation of different modules was undertaken by recording percent shoot and fruit infestation and yield. Repeated field visits were made to determine the level of invasion. The treatment application were initiated on achieving ETL (5% infestation) and later spraying was done at and interval of fifteen days. Per cent fruit infestation was recorded on 4rd, 8th and 12th days after spraying (DAS) for which five plants per plot were selected and categorized, low percentage of Shoot infestation was also recorded.

Percent shoot infestation was comparatively lower in module M4 (spinosad + M.anisoplae + Fe- EDTA + cartap hydrochloride) (7.47) followed by M5 (9.40) and M1 (6.65) which were at par with each other (Table).

Table: - Effect of different IPM modules on shoot & fruit infestation and yield in brinjal (mean values).

Modules	% shoot Infestation	Per cent fruit infestation		Yield	
		4 DAS	8 DAS	12 DAS q/ha	
M1	9.65 (18.06)	25.97 (30.54)	24.47 (26.33)	26.11 (30.65)	65.55
M2	13.59 (21.54)	30.58 (33.54)	31.72 (34.26)	21.18 (34.54)	71.74
M3	15.55 (23.13)	35.30 (36.39)	34.96 (36.21)	35.23 (36.31)	57.14
M4	7.47 (15.47)	23.21 (28.76)	21.09 (29.22)	23.62 (28.89)	81.82
M5	9.40 (17.82)	28.61 (32.18)	30.81 (33.71)	30.25 (33.33)	66.58
M6	22.28 (28.14)	41.22 (39.87)	41.15 (39.85)	38.55 (33.33)	46.58
M7	35.45 (36.58)	50.44 (45.25)	53.56 (47.14)	58.74 (50.05)	21.34
(Control)					
'F' test	Sig	Sig	Sig	Sig	
SE (m) #	1.24	1.45	2.24	1.12	
CD at 5 %	2.46	4.08	4.71	3.33	
CV%	7.60	8.25	8.95	6.18	

Figures in parenthesis are sine transformed value M1= (weekly removal of affected shoot + spinsad@ 0.005) + Btk 1kg/ha + cartap hydrochloride 50 SP @ 0.5%); M2= (spinosad + 45 EC @ 0.05% + sunhemp as a barrier crop + FE- EDTA 0.05% + garlic and chrysanthemum extract 1% + cartap hydrochloride 50 SP @ 0.1); M4= (spinosad + 45 EC @ 0.01% + Manisoplae 205 kg/ha + 45 FE-EDTA 0.5% + cartap hydrochloride 50 SP @ 0.5); M5= (Coriander intercropping spinosad + 45 EC (1:1) @ 0.01% + Garlic and chrysanthemum extract 1% + FE- EDTA 0.5% + endosulfan 35 EC @ 0.05%); M6 = (confider 17.8 SL @ 0.01 + endosulfan 35 EC @ 0.05% monocrotophos 36 WSC @ 0.05 + cypermethrin 25 EC @ 0.005); M7 = Untreated control.

As regards fruits infestation on 4rd, 8th, and 12th DAS, module M4 was found superior recording minimum fruit infestation of 23.21%, 21.09% and 23.62% respectively followed by M1 (weekly removal of affected shoots + spinosad + Btk + cartap hydrochloride) having 25.97%, 24.47%, and 26.11%, respectively Earlier, BYLEMONS and SCHOONEJIANS (2000) reported the effectiveness of spinosad because of its contact, stomach and systemic action with long residual effect it was also true with cartap hydrochloride. *M. anisoplae* was effective against *L. orbonalis* by deforming the larvae reported effectively of chelating agent due to its antibiotic effect on larvae and by causing sterility, There were also significant differences in the yield recorded in different modules, being highest in module M4 (81.82q/ha) thus module M4 proved to be most economical and effective.

REFERENCES

BYLEMONS and SCHOONEJIANS (2000) Spinosad, a useful tool for insect control in fruits. NCPC Conference, Pest and Diseases: 33-44

