

Short communication

## **Efficacy of IPM module in against fruit borer (*Helicoverpa armigera*) on Tomato**

**Arvind N Singh and RK Singh**

Received : Dec 2008 / Accepted : Dec 2010

Among 23 insect pests reported to be associated with tomato fruit borer, *Helicoverpa armigera* (Hubner) is most detrimental, inflicting (Amutha and Manisegran, 2005) in different parts of country. With the increasing awareness of environmental problems due to continuous use of chemical insecticide, search of an alternate method become necessary. A number of ecofriendly measures have been developed in India to manage *H. armigera* which includes use of NSKE, NPV, trap crops and seedling root dip in insecticides. (Anonymous, 2001). The plant protection technology through IPM evolved by NARS, has to be validated with farmers. (Singh and Trivedi, 2001). Thus, the present studies were conducted for evaluating the efficacy of IPM module in comparison of chemical insecticide at farmer's field.

Field experiments were conducted at the village Pipnar, block Birno, Ghazipur on farmer's field during two cropping seasons of 2004 and 2005 on tomato var Rupai. There were 5 treatments viz., cypermethrin 25EC (0.01%), endosulfan 35EC (0.07%), nimbecidine 0.03% (0.3%), Integrated Pest Management (IPM) module (includes seedling root dip with imidachlorpid @ 0.3ml/

lit+ intercropping with marigold in such away that their flowering concides and 16 rows of tomato was intercropped with one row of marigold and + NSKE 5%+ Ha-NPV 250 LE) and untreated control. All the treatments were replicated 4 times in randomised block design in 2m<sup>2</sup> plots. Each insecticide was applied as foliar spray thrice at 10 days interval of each treatment commencing from initial flowering stage of the crop. Observation was recorded on fruit borer infestation by weighing damage (unmarketable) at each picking for calculating fruit damage.

Data presented in Table 1 revealed that all the insecticidal treatment and IPM module were significantly effective over control in reducing the fruit damage during both the years. The incidence in general was higher during the year 2004 showing 11.25 to 47.05 per cent fruit damage compared to 10.22 to 30.30 during 2005. Lowest incidence was recorded in plots treated with cypermethrin in which the damage percentages were 11.25 and 10.22 in 2004 and 2005, respectively, with an overall mean of 10.74 per cent followed by endosulfan (15.82%) and nimbecidine (17.51%). The IPM module proved almost equally effective in minimising fruit damage (11.41%) which was lower than endosulfan and nimbecidine treatment, while at par with cypermethrin.

These observations suggested that the use of toxic chemicals could be dispensed off by use of IPM module including seedling root dip, intercropping with African marigold and spraying of NSKE and NPV. Seedling treatment with imidachlorpid was aimed to protect the plant from sucking pests. Application of NSKE has been reported to be selectively effective against early larval instars of *H. armigera*. (Krishnmurthy and Sardana, 2001). Neem products are widely used effective by many

---

Arvind N Singh and RK Singh  
Krishi Vigyan Kendra, Post-graduate College,  
Ghazipur-233001

**Table:** Percent damage of tomato by fruit bases in different treatments

Treatments	Mean damage per cent		Overall mean
	Years		
	2004	2005	
Cypermethrin 0.01%	11.25	10.22	10.74
Endosulfan 0.07%	18.29	13.36	15.82
Nimbecidine 0.03%	20.58	14.45	17.51
IPM module	11.15	11.67	11.41
Control	47.05	30.30	38.67
CD at 5%	4.93	3.61	3.10
SEM $\pm$	15.19	11.14	9.00

workers against fruit borer (Sarode *et al.*, 1995; Raut, 2000). Our findings are similar to observations exhibiting efficacy of trap intercrops to divert insects for oviposition. African marigold has been shown to attract moths for oviposition and continuous harvesting of these flowers taken them away from the main crop (Srinivasan *et al.*, 1993). Efficacy of NPV at 250 LE has been found to effective in controlling fruit borer in tomato by Krishnamurthy and Sardana (2001), Ganguly *et al.* (1997) and Singh *et al.* (1994).

The present study bears significance in sowing the efficacy of logical use of some known eco-friendly strategies as a package to prevent the damage in tomato fruits by *H. armigera* in this area. This will ensure safety to insecticide residue, environmental balance and economic viability.

## References

- Amutha M, Manisegran S (2005) Biophysical basis of resistance in certain promising tomato accessions against tomato fruit borer, *Helicoverpa armigera* (Hubner). Indian journal of Entomology 67 (2): 155-161
- Ganguly RN, Singh VV, Dixit SA (1997) Efficacy of NPV (Nuclear Polyhedral Virus) and endosulfan against tomato fruit borer, *Heliothis armigera*. Current Research 26 (11): 210-212
- Krishnamurthy PN, Sardana HR (2001) IPM in cabbage and tomato. In: Singh Amerika, Trivedi TP, Dhandapani A and Sabir Naved (eds), Resource manual on validation and promotion of IPM NCIPM New Delhi, pp 90-100
- Raut SK (2000) Bioefficacy of some insecticides and neem products against *Heliothis armigera* (Hubner) on tomato. Pestology 24 (8): 30-31
- Sarode SV, Patil PP, Borker SL (1995) Evaluation of neem seed kernel extract (NSKE) in combination with *Heliothis* Nuclear polyhedral virus against cotton bollworm. Journal of Entomological Research 19 (3): 219-222
- Singh Amerika, Trivedi TP (2001) Integrated pest management- A system approach. In: Singh Amerika, Trivedi TP, Dhandapani A and Sabir Naved (eds), Resource manual on validation and promotion of IPM NCIPM New Delhi pp 90-100
- Singh V, Mathur NM, Hussain A, Kalyan RK, Sharma GK (1999) Evaluation of some eco-friendly pesticides modules against *Heliothis armigera* (Hub.) in tomato. Indian Journal of Applied Entomology 13:71-74
- Srinivasan K, Krishnamurthy PN, Raviprasad TN (1993) Evaluation of different trap crop for the management of fruit borer, *Helicoverpa armigera* (Hubner) on tomato. In: Proc. Golden jubilee symposium of Horticultural research-changing scenario, 24 may to 28 may, 1993, Bangalore pp259.