Research Note :

Determination of LT$_{50}$ values of novel insectides against *Leucinodes orbonalis* guenee

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SUMMARY

The present investigation was carried out at Post Graduate Laboratory, Department of Entomology, PGI, MPKV, Rahuri during *Kharif* 2007. The results revealed that critical time required to affect 50 per cent *Leucinodes orbonalis* larval population mortality for emamectin benzoate was observed 4.46 days with upper and lower fiducial limits of 5.172 and 3.849 days, respectively. For novaluron, it was observed 3.83 days with upper and lower fiducial limits of 4.632 and 3.181 days, respectively. The recorded LT$_{50}$ value for diflubenzuron was 2.65 days with 3.398 and 2.067 days upper and lower fiducial limits. For *BtK*, it was observed 1.50 days with upper and lower fiducial limits of 2.104 and 1.078 days, respectively

Brinjal, the king of vegetable, is an important crop because of its nutritional, medicinal as well as commercial value. Brinjal or egg plant, (*Solanum melongena* Linn.) belonging to family Solanaceae is native of India. Brinjal fruits are preferred by the people because of its high nutritive value. It is available every where at reasonable price hence is known as 'poor man's vegetable'. The shoot and fruit borer of brinjal has been reported throughout the country (Patel and Basu, 1948). It is most destructive and active throughout the year. Being an internal feeder, it is very difficult to control, frequent sprayings of chemicals are required which reduce further multiplication of the pest. However, indiscriminate use of synthetic pesticides has created several problems to ecosystem resulting in environmental pollution, residues in brinjal fruits (Sarode *et al*., 1985), health hazards (Mehrotra, 1990) etc. Keeping the aforesaid facts in view, the lethal time of novel insecticides required to kill the 50 per cent larval population on brinjal fruits was studies.

The present investigation was carried out at Post Graduate Laboratory, Department of Entomology, MPKV, Rahuri, Dist. Ahmednagar (M. S.) during *Kharif*, 2007. Solution of each of diflubenzuron, novaluron, *BtK* and emamectin benzoate was prepared at the recommended dosage and sprayed on 120 day old brinjal plants to the point of 'run-off'. Tender fruits from each plots were harvested at 0, 1, 3, 5, 7, 10 and 14 day interval after the treatment and brought to the laboratory. The fruits were placed in plastic bottles (10 cm diameter) and 20 starved first instar larvae were released on the treated fruits which were later kept in incubator at 26.0 ± 1 ^{0}C. Mortality counts were taken 24 hours after their confinement by cutting open the fruits under a binocular microscope. Moribund insects were taken as dead. Mortality was corrected by Abbott's (1925) formula. LT50 Values analyzed according to Finney (1952) method.

The time needed to kill 50 per cent of the test population was calculated for diflubenzuron, novaluron, *Bt*K and emamectin benzoate. The LT$_{50}$ values obtained for different insecticides are presented in Table 1.

The results of Table 1 reveal that critical time required to affect 50 per cent larval population mortality for emamectin benzoate was observed 4.46 days with upper and lower fiducial limits of 5.172 days and 3.849 days, respectively. Ghosh *et al*. (2008) recorded the relative toxicity of emamectin benzoate to third instar larvae of *S. litura* after 24 hours of exposure. Stanley *et al*. (2006) found that maximum larvicidal action of emamectin benzoate against *H. armigera* and *S. litura* under laboratory condition. For novaluron, it

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Sr. No.	Insecticide	Heterogeneity X^2	Regression equation	LT_{50} (days)	Fiducial limits	
					Upper	Lower
1.	Diflubenzuron 25 WP @ 50 g a.i. ha^{-1}	3.49	Y = 4.8646 – 1.1548 X	2.65	3.398	2.067
2.	Novaluron 10 EC @ 25 ml a.i. ha^{-1}	7.00	Y = 4.8686 – 1.5137 X	3.83	4.632	3.181
3.	*Bt*k 11 WG @ 500 g ha^{-1}	4.36	Y = 4.7541 – 0.9380 X	1.50	2.104	1.078
4.	Emamectin benzoate 5 SG @ 10 g a.i. ha^{-1}	1.25	Y = 4.9623 – 1.8371 X	4.46	5.172	3.849

Table 1 : Determination of LT_{50} values of novel insecticides against neonate larvae of *Leucinodes orbonalis*

was observed 3.83 days with upper and lower fiducial limits of 4.632 days and 3.181 days, respectively. Wavare *et al.* (2008) noticed cent per cent larval mortality of first and second instar larvae of brinjal shoot and fruit borer in treatment with novaluran. The recorded LT_{50} value for diflubenzuron was 2.65 days with 3.398 days and 2.067 days with upper and lower fiducial limits, respectively. Mortality of 1st instar larvae with diflubenzuron was recorded 41.67 to low per cent by Kadam *et al.* (1995). For *BtK*, it was observed 1.50 days with upper and lower fiducial limits of 2.104 days and 1.078 days, respectively. Justin *et al.* (1988) reported that the *BtK* (Bactospeine) was the most toxic (LT50 21.90 hrs.) followed by *BtK*(kurstaki) LT50 22.60 hrs.

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