

Short Communication

Bio-efficacy of insect growth regulator against tobacco caterpillar in blackgram

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Tobacco caterpillar (*Spodoptera litura* Fab.) is polyphagous in nature and causes considerable damage to pulses, oilseeds, cotton and vegetables (Seema Rani *et al.* 2002). Blackgram is an important pulse crop which is mainly cultivated as a *rabi* crop under rice fallows in certain areas of Andhra Pradesh. *S. litura* is known to infest blackgram from preflowering to pod development stage and causes considerable yield losses especially during September to February. Several chemical pesticides to control *S. litura* were studied; however, problems like build up of resistance to insecticides, harmful effects to non-target organisms, etc are major limiting factors in their use. In this context, insect growth regulators (IGRs) inhibiting chitin synthesis in insects, which are selective in action, less hazardous to the environment (Vadodaria *et al.* 2000; Kuldeep and Rahman 2004), were considered to be appropriate. Therefore, present study was undertaken to evaluate the efficacy of an IGR, *viz.*, lufenuron (Cigna 5 EC) against *S. litura* in blackgram at Regional Agricultural Research Station, Warangal during *rabi*, 2006.

Field trial was laid out in a randomized block design with seven treatments *viz.*, lufenuron 5EC @ 20, 25, 30 g *a.i./ha*, thiodicarb 75 WP @ 750 g *a.i./ha*, quinalphos 25 EC @ 250 g *a.i./ha*, endosulfan 35 EC @ 525 g *a.i./ha* and an untreated control. Each treatment was replicated three times. The experiment was conducted with the test variety WBG-26,

following all recommended agronomic practices in deep black soil under irrigated conditions. The plot size was 28 m². Spacing adopted was 40 x 10 cm. The experiment was sown on 27-09-06 and harvested on 20-12-06. Incidence of *S. litura* was noticed right from last week of October to last week of November, 2006. Four sprayings were taken up at 10 days interval starting from the initial notice of the pest. Observations were recorded on total number of defoliated leaves/plant on five randomly selected plants in each plot before spraying and 7 days after spraying. The data on defoliation (%) due to larval feeding was computed.

Significant differences were found among the treatments subsequent to spraying. Seven days after I spraying, per cent defoliation was lowest in the plot treated with lufenuron @ 30 g *a.i./ha* (12.61) followed by thiodicarb @ 750 g *a.i./ha* (14.56) which were at par with each other. Lufenuron @ 25 g *a.i./ha* with 16.16 per cent defoliation was equally effective as thiodicarb @ 750 g *a.i./ha*. Quinalphos @ 250 g *a.i./ha*, endosulfan @ 525 g *a.i./ha* and lufenuron @ 20 g *a.i./ha*, with defoliation in the range of 19.77 to 22.01%, were at par with each other. Lufenuron @ 30 g *a.i./ha* recorded 11.30 per cent defoliation and was significantly superior over all other treatments after the second spray, followed by thiodicarb @ 750 g *a.i./ha*, quinalphos @ 250 g *a.i./ha* (Table 1). Lufenuron @ 30 g *a.i./ha* maintained consistency in recording

Table 1. Efficacy of lufenuron on tobacco caterpillar, *Spodoptera litura* in blackgram

| Treatment | Dose (g <i>a.i./ha</i>) | Per cent defoliated leaves | | | | | Cumulative mean of sprays | Yield Kg/ha |
|-------------------|-----------------------------|----------------------------|---------------------------|-----------------------------|-----------------------------|----------------------------|------------------------------|----------------|
| | | Pre treatment | 7 days after Ist spray | 7 days after IIInd spray | 7 days after IIIrd spray | 7 days after IVth spray | | |
| Lufenuron 5 EC | 20 | 13.73 (21.72) | 19.80 (26.42) | 29.70 (33.02) | 31.33 (34.02) | 30.67 (33.66) | 27.86 (31.88) | 1443 |
| Lufenuron 5 EC | 25 | 12.63 (20.75) | 16.16 (23.73) | 24.60 (29.73) | 24.98 (30.00) | 23.67 (29.13) | 22.36 (28.26) | 1707 |
| Lufenuron 5 EC | 30 | 13.65 (21.66) | 12.61 (20.79) | 11.30 (19.64) | 13.07 (21.22) | 13.57 (21.64) | 12.64 (20.79) | 1757 |
| Thiodicarb 75 WP | 750 | 15.58 (23.12) | 14.56 (22.46) | 16.00 (23.58) | 17.02 (24.36) | 17.37 (24.66) | 16.24 (23.73) | 1750 |
| Quinalphos 25 EC | 250 | 14.96 (22.60) | 19.77 (26.42) | 19.60 (26.28) | 22.26 (28.18) | 22.57 (28.38) | 21.04 (27.28) | 1582 |
| Endosulfan 35 EC | 525 | 16.11 (23.65) | 22.01 (27.97) | 27.73 (31.76) | 24.99 (30.00) | 25.33 (30.20) | 25.00 (30.00) | 1546 |
| Untreated control | - | 15.98 (23.12) | 28.01 (31.95) | 34.03 (35.57) | 32.35 (34.70) | 34.37 (35.91) | 32.19 (34.57) | 1171 |
| F-Test | - | NS | * | * | * | * | * | * |
| SEm ± | - | - | 0.71 | 0.5 | 0.95 | 1.06 | 0.52 | 63.04 |
| CD (P=0.05) | - | - | 2.19 | 1.54 | 2.94 | 3.27 | 1.6 | 1.94 |

*Significant at P=0.05, Figures in parentheses arc-sine transformations

lowest defoliation subsequent to all sprays (11.30 to 13.57%) and was superior over all other treatments throughout crop period. Highest defoliation was observed in untreated plot throughout the crop period.

Mean defoliation over all the sprays indicated that lufenuron @ 30 g a.i./ha with 12.64 per cent defoliation was significantly superior over other treatments. Thiodicarb @ 750 g a.i./ha with 16.24 per cent defoliation was the next best treatment. Quinalphos @ 250 g a.i./ha and lufenuron @ 25 g a.i./ha were equally effective. Data taken on plot yield revealed that highest yield was recorded in the plots treated with lufenuron @ 30 g a.i./ha (1757 kg/ha) and thiodicarb (1750 kg/ha). Untreated control plot recorded lowest yield among all treatments. Kuldeep *et al.* (2004) reported that lufenuron (Match 5 EC) suppressed growth and development of *S. litura* under laboratory conditions. He reported that per cent pupation and adult emergence were severely reduced.

It is concluded that, lufenuron 5 EC @ 30 g a.i./ha and thiodicarb 75 WP @ 750 g a.i./ha reduced defoliation by *S. litura* and increased the yield and can be used as effective measures against *S. litura* in blackgram ecosystem.

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