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EFFICACY OF SOME IPM MODULES AGAINST *HELICOVERPA ARMIGERA* (HUB.) INFESTING GRAM

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Abstract

The present investigation on development of integrated management technology against *H. armigera* was carried out at Agronomy farm, Rajasthan College of Agriculture, Udaipur. The highest yield (12.53 and 13.50 q/ha) was obtained when the crop was treated with module M-7 (comprising of acephate 1.25 Kg/ha followed by endosulfan 1.25 litre/ha) and minimum yield of 7.06 and 7.90 q/ha was obtained when the crop was treated with modules M-5 (comprising of mahua oil 2 litre/ha. followed by eucalyptus oil 2 litre /ha.) The minimum increase in yield (6.75 and 6.41 q/ha) over control was recorded in the plots treated with modules M-7 and minimum 1.28 and 0.81 q/ha from plot treat with modules M-5 minimum per cent pod damage 5.66 and 6.48 were recorded in M-7 and maximum per cent damage was recorded (19.79 of 24.48) in modules M-5

Key words : *Heliothis armigera*, ETL, gram, randomized block design (RBD), eucalyptus oil.

Introduction

Gram is grown extensively in India covering about 6.1 million hectare area with an annual production of 5.3 million tones having an average productivity of 865 kg/ha (Anonymous, 2002). Chickpea (*Cicer arietinum* L.) is one of the more widely cultivated *rabi* pulse crops in india. Due to its high nutritional value chickpea forms an important component of the vegetarian diet. Owing to its ability to fix atmospheric nitrogen gram is suitable for crop rotation (Kudale *et al*., 2002). Commonly know as gram or Bengal gram is considered as the "King of Pulses". Grain legumes play an important role in overcoming the quantitative and qualitative protein requirement for a large parts of humanity (Bhati and Patel, 2001). About 60 insect species have been reported to feed on chick pea (Reed and Pawar, 1982).

In recent year, much interest has been evinced in the use of plant products as insecticides to control agricultural agriculture pest in view environmental and health hazards of synthetic organic pesticides. The plant products have been used since long for the control of crops pests management, he microbes and botanical products play an important role in regulating the pest population.

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Materials and Methods

To study the efficacy of IPM modules against *H. armigera* the experiment was carried out at Agronomy Farm, Rajasthan College of Agriculture, Udaipur during *Rabi* 2001-2002 and 2002-2003. Gram crop (variety-Dahod yellow) was sown on 15 and 16 October respectively. Row to row and plant to plant distance was maintained 30 cm and 10 cm. respectively. Experiment was laid out in a randomized block design (RBD). There were eight treatment modules including the control and each treatment modules was replicated four times. The size of the each replicated plot was keep 2.7 × 4.2 m (11.34 sq.m.). The data on yield from these experiments were subjected to statistical analysis to evaluate the impact of different treatments on yield. The increase in yield over control was calculated from each management modules.

Results and Discussion

During, the year first year and second year, all modules were found significantly superior in reducing pod damage and increase yield, over control. The maximum

Table 1 : Efficacy of some IPM modules against *Helicoverpa armigera* (Hub.) infesting gram.

S. no.	I Year				II Year		
	Management modules	% pod damage	Yield (Q/ha.)	Grain yield increased over control (Q/ ha.)	% pod damage	Yield (Q/ ha.)	Grain yield increased over control (Q/ha.)
01.	M-1	15.00(14.98)	8.51	2.73	17.11(17.07)	10.11	3.02
02.	M-2	11.75(11.72)	8.83	3.05	12.03(11.98)	10.29	3.20
03.	M-3	17.50(17.49)	7.36	1.58	19.32(19.28)	8.89	1.80
04.	M-4	8.70(8.69)	11.22	5.44	9.12(8.97)	12.80	5.71
05.	M-5	19.80(19.79)	7.06	1.28	24.52(24.48)	7.90	0.81
06.	M-6	18.67(18.66)	7.20	1.42	21.47(21.39)	8.70	1.61
07.	M-7	5.67(5.66)	12.53	6.75	6.57(6.48)	13.50	6.41
08.	M-8	25.06(25.05)	5.78	-	28.54(28.52)	7.09	-
	SEm+	0.8957	0.3216	—	0.9248	0.3658	—
	CD at 5%	2.6344	0.9457		2.7198	1.0758	

Management modules:

M-1	Spinosad (750 ml/ha) first spray at pod initiation stage followed by B.t.k.(1.25 kg/ha) spray at grain filling stage.
M-2	B.t.k. (1.25 kg/ha) first spray at pod initiation stage followed by acephate (1.25 kg/ha) spray at grain filling stage.
M-3	Diflubenzuron (Dimlin) (200 gm/ha) first spray at pod initiation stage followed by neem oil(2 litre/ha) spray at grain filling stage.
M-4	Endosulfan (1.25 litre/ha) first spray at pod initiation stage followed by Spinosad (750 ml/ha) spray at grain filling stage.
M-5	Mahua oil (2 litre/ha.) first spray at pod initiation stage followed by eucalyptus oil (2 litre /ha) spray at grain filling stage.
M-6	Neem oil (2 litre/ha.) first spray at pod initiation stage followed by Karanj oil (2 litre /ha) spray at grain filling stage.
M-7	Acephate (1.25 Kg/ha) first spray at pod initiation stage followed by Endosulfan (1.25 litre/ha) spray at grain filling stage.
M-8	Control

yield (12.53 and 13.50 q/ha) and minimum per cent pod damage (5.66 and 6.48 per cent) was recorded in module comprising of spray if acephate 1.25 kg/ha. at pod initiation stage followed by endosulfan 1.25 lit./ha, at grain filling stage (M-7), respectively.

This finding is in conformity with the findings of Shinha (1993), who also recorded 17.21 and 14.05 per cent infestation in two years, respectively. Patil and Dethe (1995) recorded highest yield (13.54 q/ha.) and minimum (12.37%) pod damage with treatment of Endosulfan in pigeon pea. Similarly, Bhati and Patal (2001) and Kudale *et al*. (2002) recorded maximum per cent pod damage with endosulfan.

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