

IMPACT OF NEWER INSECTICIDES ON LADYBIRD BEETLES (*MENOCHILUS SEXMACULATUS* L.) IN HYBRID COTTON

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ABSTRACT

The experiment was carried out at Field of Department of Agricultural Entomology, College of Agriculture, Dhule (Maharashtra) during *Kharif* season 2011-2012 to study the effect of 8 newer insecticides on lady bird beetles in cotton crop. The experiment was laid out in a randomized block design (RBD) with nine treatments (8 insecticide treatments+1 untreated control) replicated thrice. Eight insecticides viz. Imidacloprid 17.80 SL, Fipronil 5 SC, Thiamethoxam 25 WG, Imidacloprid 70 WG, Triazophos 40 EC, Acetamiprid 20 SP, Fipronil 80 WG, Lambda cyhalothrin 5 SC were tested to suppress sucking pests in cotton. The activity of natural enemies, such as ladybird beetle population on the sucking pests attacking Bt cotton hybrid cultivar RCH-2 BG-II were recorded. Ladybird beetles (*Menochilus sexmaculatus* L.) were abundant in the field but their population decreased in the treated plots as compared to untreated control. Mean population of lady bird beetle per plant was more in untreated control (1.51 ladybird beetles /plant) and statistically was non-significant. In case of different insecticide treatments lambda cyhalothrin 5 SC (0.96 ladybird beetles /plant) and imidacloprid 17.80 SL (0.92 ladybird beetles /plant) were found ecofriendly.

INTRODUCTION

Cotton is one of the important cash crops cultivated in India. It is attacked by several sucking pests right from germination to picking. Among sucking pests, aphid is a major one, which is naturally regulated by lady bird beetle, *M. sexmaculatus*. Insecticides were found most detrimental to coccinellids as observed in untreated check (Patel and Vyas, 2000). More than 10 percent of the worlds pesticides and nearly 25 percent of worlds insecticides are used in cotton farming (Khadi, 2003). But due to frequent and overuse of in-

secticides, population of lady bird beetle is greatly affected. Hence, to find out some safe insecticides, field trials with different synthetic insecticides were conducted on cotton during kharif 2011-12.

MATERIAL AND METHODS

The experiment was carried out at Field of Department of Agricultural Entomology, College of Agriculture, Dhule (Maharashtra) during *Kharif* season in 2011-12. Nine treatments including untreated control were replicated thrice in randomized block design

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(RBD). Bt cotton hybrid RCH-2 BG-II variety was sown in 5.4 x 3.6m plots at row and plant spacing of 90 x 90cm. Crop was raised following recommended agronomic practices. Newer systemic insecticides were applied at ETL (Economic Threshold Level) levels for control sucking pests on Bt cotton hybrid. Sprays were given by using hand operated knapsack sprayer. Lady bird beetle population was recorded from five randomly selected tagged plants in each plot before treatment and at 3, 7 and 14 days after treatment.

RESULTS AND DISCUSSION

The pre treatment lady bird beetle per plant was recorded in the range of 1.20 to 1.66 and was statistically non-significant.

After first spray

Three days after treatment

Population of lady bird beetles per plant was recorded in the range of 0.53 to 1.46 and was statistically non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.46). Among the insecticide treatments higher population of lady bird beetles per plant was recorded in lambda cyhalothrin 5 SC (1.06) while lower population recorded in both imidacloprid 70 WG and triazophos 40 EC (0.53) Table 1.

Seven days after treatment

Population of lady bird beetles per plant was recorded in the range of 0.66 to 1.00 and was statistically non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.00). Among the insecticide treatments higher population of lady bird beetles per plant was recorded in lambda cyhalothrin 5 SC (0.80) while lower population recorded in fipronil 5 SC (0.66) Table 1.

Fourteen days after treatment

Population of lady bird beetles per plant was recorded in the range of 0.40 to 1.86 and was statistically non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.86). Among the insecticide treatments higher population of lady bird beetles per plant was recorded in imidacloprid 17.80 SL (0.86) while lower population recorded in thiamethoxam 25 WG (0.40) Table 1.

Table 1. Efficacy of newer insecticides against Lady bird beetle on Bt cotton hybrid during Kharif 2011.

Treat. No.	Treatments	Concentration	Pre-count	Mean no. of lady bird beetle/3 leaves (Top, Middle & Bottom)			Overall	mean of two sprayings
				3 DAS	7 DAS	14 DAS		
T ₁	Imidacloprid 17.80 SL	20 g ai/hac.	1.33(1.35)	0.66(1.07)	0.73(1.10)	0.86(1.16)	1.80(1.51)	0.92(1.19)
T ₂	Fipronil 5 SC	50 g ai/hac.	1.26(1.32)	0.80(1.14)	0.66(1.07)	0.40(0.94)	1.60(1.44)	0.78(1.13)
T ₃	Thiamethoxam 25 WG	50 g ai/hac.	1.20(1.30)	0.80(1.14)	0.86(1.16)	0.53(1.01)	1.26(1.32)	0.76(1.12)
T ₄	Imidacloprid 70 WG	80 g ai/hac.	1.13(1.27)	0.53(1.01)	0.80(1.14)	0.60(1.04)	0.66(1.07)	0.64(1.06)
T ₅	Triazophos 40 EC	400 g ai/hac.	1.46(1.40)	0.53(1.01)	0.73(1.10)	0.60(1.04)	0.86(1.16)	0.70(1.09)
T ₆	Acetamiprid 20 SP	20 g ai/hac.	1.46(1.40)	0.80(1.14)	1.00(1.22)	0.66(1.07)	1.20(1.30)	0.85(1.16)
T ₇	Fipronil 80 WG	64 g ai/hac.	1.46(1.40)	0.93(1.19)	0.86(1.16)	0.80(1.14)	1.53(1.42)	0.89(1.17)
T ₈	Lambda cyhalothrin 5 SC	12.5 g ai/hac.	1.66(1.46)	1.06(1.24)	0.80(1.14)	0.86(1.16)	1.20(1.30)	0.96(1.20)
T ₉	Untreated control		1.33(1.35)	1.46(1.40)	1.00(1.22)	1.0(1.22)	1.93(1.55)	1.51(1.41)
	SE±		0.05	0.16	0.05	0.10	0.08	0.91
	CD @ 5%		NS	NS	NS	NS	NS	NS

Figures in parentheses are square root of (X + 0.50) transformed values

After second spray**Three days after treatment**

Population of lady bird beetles per plant was recorded in the range of 0.40 to 1.00 and was statistically non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.00). Among the insecticide treatments higher population of lady bird beetles per plant was recorded in lambda cyhalothrin 5 SC (0.86) while lower population recorded in fipronil 5 SC (0.40) Table 1.

Seven days after treatment

Population of lady bird beetles per plant was recorded in the range of 0.60 to 1.86 and was statistically non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.86). Among the insecticide treatments higher population of lady bird beetles per plant was recorded in lambda cyhalothrin 5 SC (1.06) while lower population recorded in triazophos 40 EC (1.00) Table 1.

Fourteen days after treatment

Population of lady bird beetles per plant was recorded in the range of 0.86 to 1.93 and was statistically non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.93). Among the insecticide treatments higher population of lady bird beetles per plant was recorded in imidacloprid 17.80 SL (1.80) while lower population recorded in both imidacloprid 70% WG and triazophos 40 EC (0.86) Table 1.

Overall mean effect of two sprays

From the overall mean of two sprayings Table 1 it is clear that mean population of lady bird beetle per plant was recorded in the range of 0.70 to 1.51 and statistically was non-significant. The maximum population of lady bird beetles per plant was observed in untreated control (1.51 ladybird beetles/plant). Among different insecticide treatments lambda cyhalothrin 5 SC (0.96 ladybird beetles/plant) and imidacloprid 17.80 SL (0.92 ladybird beetles/plant) were found ecofriendly. Imidacloprid 70 WG (0.64) was found harmful to the lady bird beetle. Our results also supported by Hossain et al. 2008 who tested efficacy of imidacloprid on ladybird beetles in cotton crop.

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