

Effect of some insecticides and botanicals on predatory lady bird beetles (Coleoptera : Coccinellidae) in cotton

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SUMMARY

The study was carried out at Agriculture College Farm, Anand Niketan College of Agriculture, Warora to evaluate the effect of some insecticides and botanicals on pest of cotton and their subsequent effects on natural enemies like predatory lady bird beetles. The departmental research trials were conducted during the year 2008-09 and 2009-10. The plot size was 10×5m with three replications in RBD. The number of predatory lady bird beetles on sucking pests like aphids, jassids, white fly etc. in cotton field were counted and average was calculated. Among the different treatments dashparni ark showed 4.75 LBB / Plant followed by emamectin benzoate 5% SG (3.80 LBB / Plant) and dimethoate 30 EC 0.03% (1.65 LBB / Plant). The insecticidal treatments shown less number of lady bird beetles in cotton.

Key Words : Botanicals, Predatory lady bird beetles (LBB)

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Cotton is one of the important crop in eastern Vidarbha zone in Maharashtra. Several chemical insecticides and botanicals (plant originated insecticides) are used on this crop. Biological control is the action of parasitoids, predators and pathogens in maintaining other organism's density at a lower average than would otherwise occur (DeBach, 1964). The biological control is one of the most effective means of achieving insect control (Pedigo, 2004). It includes both naturally occurring control and control achieved as a result of man's augmentation of the natural enemy component. Natural enemies / biological control agents are the most important factors to regulate the pest population for keeping the insect pests below economic injury level in local

bean field. Among them lady bird beetles, tiger beetle, Pentatomid bug, spiders, dragon flies, ichneumonids, brachonids, tachinids, chalcids are important biological control agents.

Predators are the organisms, which directly attack, kill and eat one of the other species (Sathe and Bhosale, 2001). Typically, insect predators are characterized by a set of attributes that distinguish them from parasitoids, the other major group of entomophagous insects. They are large relative to their prey and require more than one prey individual to complete development; they have free-living predatory immature stages; and many species of insect predators are predacious as both immature and adults (Hagen *et al.*, 1976). The population growth of any pest species is effectively controlled by their natural enemies (Vorley, 1986). The lady beetles are predacious both at larval and adult stages and feed on various crop pests such as aphids and other soft bodied insects like brown plant hopper, thrips etc (Rawat and Modi, 1969 and Kring *et al.*, 1985). The female lady bird beetles are more effective in aphid predation in compared to the male beetles (Chowdhury *et al.*, 2008).

Farmers usually spray insecticides in their field indiscriminately even without thinking the economic return

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of their investment. As a result, harmful impact of insecticides on man, animal, wild life, beneficial insects and environment is posing a serious threat. It also causes insecticide resistance in insect pests, resurgence and secondary pest outbreak. Moreover, there are some insecticides, which are relatively safer for natural enemies, effective in controlling the pests with minimum hazards to natural enemies. But their information under Bangladesh condition is not exactly known. Therefore, the present study was conducted to study the effect of some insecticides and botanicals on predatory lady bird beetles (LBB) in cotton crop.

MATERIAL AND METHODS

The present study was conducted at Agriculture College farm, Anand Niketan College of Agriculture, Warora, dist. Chandrapur (M.S.) to evaluate the effect of insecticides and botanicals on pests of cotton and their subsequent effect on natural enemies like predatory lady bird beetles. The study was conducted during the year 2008-09 and 2009-10. The plot size was 10×5m with three replications in Randomized Block Design. The predatory lady bird beetles on aphids per plant in cotton field were counted and average was calculated.

The population of lady bird beetles was recorded on five randomly selected plants from each plot at 2, 7 and 14th after each treatment spray for both the years (2008-09 and 2009-10). The data on the population of LBB was analysed statistically after transforming the values by using the formula:

$$(\sqrt{+0.5})$$

where,

x = Average no. of lady bird beetles.

RESULTS AND DISCUSSION

It is evident from the Table 1 that, during the year 2008-09 the plots treated with plant originated insecticides like NSKE 5% (5 LBB / Plant), neemark 5% (4.8 LBB / Plant), dashparni ark 5% (4.8 LBB / Plant) shown significantly more number of lady bird beetles than chemical insecticides like acephate 75 Sp 0.03% (0.9 LBB / Plant), phosphamidon 40 EC 0.04 % (0.8 LBB / Plant), quinalphos 1.5% D (0.7 LBB / Plant), methyl parathion 2% D (0.7 LBB / Plant), Shukla *et al.* (1990) reported similar trend of *Coccinellides*.

During the year 2009-10 similar trend of predatory lady bird beetles population was observed. NSKE 5% (5.2 LBB / Plant), neemark 5% (5.1 LBB / Plant), shown lady bird beetle population near to untreated plot of cotton. The next treatments were dashparni ark 5% (4.7 LBB / Plant) followed by dimethoate 30 EC 0.03% (1.5 LBB / Plant). The insecticidal treatments shown significantly less number of LBB than botanicals. Neharkar and Suryavanshi (2003) reported similar trend about lady bird beetles.

Conclusion:

Results for both the years that is 2008-09 and 2009-10 shows that more number of lady bird beetles observed in untreated/ control plots of cotton which were at par with botanicals like NSKE 5% (5.10 LBB / Plant), Neemark 5% (4.95 LBB / Plant), Dashparni ark 5% (4.75 LBB / Plant) followed by Emamectin benzoate 5% SG (3.80 LBB / Plant),

Table 1 : Effect of insecticidal applications on field population of lady bird beetles

Sr. No.	Treatments	Number of lady bird beetles per plant		
		2008-2009	2009-2010	Mean
T ₁	NSKE 5%	5.0	5.2	5.10
T ₂	Neemark 5%	4.8	5.1	4.95
T ₃	Dashparni ark 5%	4.8	4.7	4.75
T ₄	Emamectin benzoate 5% SG	4.0	3.6	3.80
T ₅	Dimethoate 30 EC 0.03%	1.8	1.5	1.65
T ₆	Acephate 75Sp 0.03%	0.9	0.7	0.80
T ₇	Phosphamidon 40 Ec 0.04 %	0.8	0.6	0.70
T ₈	Quinalphos 1.5% D	0.7	0.6	0.65
T ₉	Methyl parathion 2% D	0.7	0.5	0.60
T ₁₀	Control	5.0	5.4	5.20
	SE (M)	0.09	0.09	0.09
	CD	0.27	0.27	0.27

Dimethoate 30 EC 0.03% (1.65 LBB / Plant). The insecticidal treatment shown significantly less number of lady bird beetles in cotton.

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