

RESEARCH ARTICLE

Effectiveness of botanicals and chemicals against Bihar hairy caterpillar (*Spilarctia obliqua*) in cowpea

■ Ved Prakash and Arun Kumar Singh

SUMMARY

The Bihar hairy caterpillar is an important pest of cowpea in central part of Uttar Pradesh. Its infestation caused high plant mortality which resulted in reduction in yield. Botanicals and chemicals components were fast and highly effectiveness against *Spilarctia obliqua* viz., endosulfan (foliar spray), carbofuran + bavistin (seed treatment), botanical and organic *Panchgavaya* (foliar spray), ipomea leaf (foliar spray), ipomea leaf + cow urine fermented (foliar spray), callotropis leaf (foliar spray), callotropis leaf + cow urine fermented (foliar spray), were evaluated during *Kharif* 2016 and 2017 at the University farm. All the insecticidal treatments were significantly superior to untreated check. Amongst these, maximum and minimum insect mortality was observed in endosulfan (70.83 %) and ipomea leaf+cow urine (31.13 %) treated plots, respectively.

Key Words : *Spilarctia obliqua*, Botanicals, Organic, Chemicals

How to cite this article : Prakash, Ved and Singh, Arun Kumar (2019). Effectiveness of botanicals and chemicals against Bihar hairy caterpillar (*Spilarctia obliqua*) in cowpea . *Internat. J. Plant Sci.*, **14** (2): 66-68, DOI: 10.15740/HAS/IJPS/14.2/66-68, Copyright@ 2019: Hind Agri-Horticultural Society.

Article chronicle : Received : 11.02.2019; Revised : 04.06.2019; Accepted : 14.06.2019

Cowpea (*Vigna unguiculata*) is a warm season annual leguminous fodder crop grown in central Uttar Pradesh. Among the important insect pests of this crop (cowpea) Bihar hairy caterpillar, *Spilarctia*

obliqua walker (Lepidoptera: Arctiidae) is a serious pest that caused severe loss, particularly to the early sown crop. It also attacks a number of crops during *Kharif* season in central plain zone of Uttar Pradesh. It's larva in young stage, feeds gregariously and eats up the chlorophyllic and green matter of the leaves. During severe attack larvae feeds so voraciously that only the mid rib is left behind and ultimately branches may be totally denude the crop within few days. Field observations generally showed the presence of 2-3 larvae on the leaves of affected plants. Since the early crop of cowpea is more remunerative to the farmer.

The pest has become a matter of concern to them.

MEMBERS OF THE RESEARCH FORUM

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Management of Bihar hairy caterpillar was tried by botanicals and chemicals. Most of the worked tried a number of insecticides to achieve the successful control. (Madhumita *et al.*, 2008) reported that the insecticides use for the management of Bihar hairy caterpillar were significantly superior especially Bach (*Acorus calamus*) over the control (Tripathi *et al.*, 2007; Nair *et al.*, 2007; Chahal and Gurdip Singh, 2003; Chowdhury *et al.*, 2001; Bhadauria *et al.*, 2001 and Singh and Singh, 2000). Has also conducted experiments to evaluate the efficacy of insecticides and bio-pesticides against Bihar hairy caterpillar and found effective.

Keeping in view and botanicals importance of crop and pest field trials were conducted to evaluate certain insecticides and their method of application in order to find out the effective and economical control measures of this pest.

MATERIAL AND METHODS

The field experiment using cowpea susceptible variety Sweta, were conducted in Randomized Block Design at the student instructional farm, Institute of Agricultural Sciences, Bundelkhand University, Jhansi (U.P.) India, during the year 2016 and 2017 in *Kharif* seasons. The plot size was 3×4 m² and spacings between rows and plants were 30 and 10 cm, respectively. There were eight treatments and each was replicated thrice. The treatments used were two chemical *viz.*, T₁: endosulfan @ 2.5 ml/lit., T₂: carbofuran + bavistin @ 3 g + 2.5 g/kg and five non-chemical T₃: *Panchgavaya* @ 150 ml/3lit., T₄: ipomoea leaf @ 50 g/lit., T₅: ipomoea leaf + cow urine @ 100 g + 150 ml/3lit., T₆: callotropis leaf @ 50 g/lit., T₇: callotropis leaf + cow urine @ 100 g + 150 ml/2lit. And T₈: was unprotected check. Spraying

was done at 30, 45 and 60 days after showing of seed by counting the total number of healthy and infested plants. The percentage of infestation was worked out and transformed to square root values for statistical analysis.

RESULTS AND DISCUSSION

All the insecticidal treatments reduced the incidence of the pest significantly as compared to control. Amongst them maximum control of the pest was recorded with the treatment endosulfan (70.83%) followed by the , seed treatments with corbofuran + bavistin (58.45) and aqueous spray of leaf extract of ipomoea (49.02), respectively, but all these treatment cause of par statistically. Pest of treatments also reduced the incidence of pest over control from (31.33%) to (40.51) per cent (Table 1).

Degri and Chaudhary (1998) has also reported that carbaryl, monocrotophos, dimethate, pirimiphos-methyl, malathion and endosulfan as effective chemical but endosulfan was found most effective as compared to other chemicals. In our experiment, *Panchgavaya* was found effective contradictory to this Byrappa *et al.* (2012) recorded as meagre control of gram pod borer and found on par with untreated control but Rekha (2005) and Mallikarjuna (2009) opined that 2 sprays at 3 per cent concentration give satisfactory results against pod borer complex on field been. Similar findings are reported in mungbean by Shivaraju (2009). Cow urine was recorded as effective treatment for the control of bihar hairy caterpillar. Contradictory to this Ramkrishna (2007) reported that clerodendron+ cow urine extract were also found least effective against Bihar hairy caterpillars, Carbofuran +bavistin, ipomoea lef, ipomoea leaf + cow urine, callotropis leaf, callotropis leaf + cow urine used

Table 1: Effect of treatments against Bihar hairy caterpillar on pod damage per cent

Treat. No.	Treatments	Concentration/doses	Insect infestation		Mean	Reduction over control (%)
			2016	2017		
T ₁	Endosulfan	2.5ml/lit.	5.10	4.97	5.04	70.83
T ₂	Carbofuran + Bavistin	3g+2.5g/kg	7.91	6.45	7.18	58.45
T ₃	<i>Panchgavaya</i>	150ml/3lit.	11.08	10.92	11.00	36.34
T ₄	Ipomoea leaf aqueous	50g/1lit.	8.89	8.73	8.81	49.02
T ₅	Ipomoea leaf + Cow urine	100g+150ml/3lit.	12.51	11.29	11.09	31.13
T ₆	Callotropis leaf aqueous	50g/1lit	12.50	11.04	11.77	31.88
T ₇	Callotropis leaf + Cow urine	100g+150ml/2lit.	10.12	10.45	10.28	40.51
T ₈	Control (Untreated)	Water spray	17.39	17.18	17.28	
	S.E. ±		1.61	0.66		
	C.D. (P=0.05) level		4.89	2.00		

in this experiment was new and not reported earlier by any researches.

Conclusion:

Botanicals and chemicals components can be easily applied to cowpea crop in the field. Foliar sprays of endosulfan and seed treatment of carbofuran + bavistin were found highly effective in managing Bihar hairy caterpillar. Considering the effectiveness of botanicals and organic insecticides against *Spilarctia obliqua*, ipomoea leaf and callotropis leaf + cow urine were emerged out as moderately effective, whereas panch gavaya, callotropis leaf and ipomoea leaf + cow urine found to be less effective treatments.

Therefore, much effort should be done for the success and sustainability of this inexpensive, healthy, easily available and ecological friendly pest control method for the small-scale and resource poor farmers.

Acknowledgement:

Authors would like to express their sincere gratitude to Department of Entomology, Institute of Agriculture Science, Bundelkhand University Jhansi (U.P.) India, for providing farm and laboratory facilities.

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