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EVALUATION OF INSECTICIDES AND BIOPESTICIDES AGAINST LEAFHOPPER *EMPOASCA KERRI* PRUTHI IN PIGEON PEA

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ABSTRACT

Green leafhopper *Empoasca kerri* (Hemiptera: Cicadellidae) is a polyphagous xylem feeder and it is a pest of pulse crops. The present study evaluated some insecticides and biopesticides against *E. kerri* in pigeonpea. The results revealed that its incidence was significantly reduced with flonicamid 50WG and tolfenpyrad 20%SC (89.39 and 81.92%, respectively) after third spray. Also, increase in yield was observed with flonicamid 50WG (13.20 q/ ha) and thiamethoxam 25WDG (12.90 q/ ha) amounting to 37.50 and 36.05%, respectively. The biopesticides viz., neemazol 1% @ 2ml/ l and *Lecanicillium lecanii* @2g/ l were found to be the least effective.

Key words: *Empoasca kerri*, pigeonpea, flonicamid 50WG, tolfenpyrad 20%SC, *Lecanicillium lecanii*, neemazol, thiamethoxam, yield, incidence

In India pigeon pea (*Cajanus cajan* L.) is cultivated in 4.78 million ha with a production of 0.98 mt (Anon, 2019). The insect pests are the main factors for the low productivity and about 250 insect pests under 8 orders and 61 families infest the crop. Since 2012, both nymphs and adults of green leafhopper *Empoasca kerri* Pruthi has been observed to be a major sucking pest and spreading to larger area on pigeonpea. The damage causes phytotoxicity, with hopper burn and economic loss (Singh et al., 2008). This study evaluates insecticides and biopesticides against this pest.

MATERIALS AND METHODS

Field experiment was conducted at the All India Coordinated Sorghum Improvement Project (AICSP), Regional Agricultural Research Station (RARS), Vijayapur, Karnataka during kharif, 2019. Insecticides including botanicals and entomopathogenic fungi were evaluated in randomized block design (RBD) with eleven treatments replicated thrice. The treatments include- flonicamid 50WG, tolfenpyrad 20SC, fipronil 5EC, thiamethoxam 25WDG, acephate 75SP, dimethoate 30EC, monocrotophos 36SL, neemazol 1%, buprofezin 20SC, *Lecanicillium lecanii* along with untreated control. Pigeonpea variety TS3R was sown in 33 plots of 5.4x 3.6 m size with a spacing of 90x 30 cm between rows and plants. The crop was raised under rainfed conditions with only one protective irrigation during the flowering stage. All the recommended agronomic practices were followed. Three sprays were adopted at vegetative and flowering stages, and counts of leafhoppers from three top leaflets were made four times for each spray, as precount, and at 5, 10, and 15 DAT (days after treatment). The data were subjected to corrections after Abbott (1925) before statistical analysis.

RESULTS AND DISCUSSION

The results revealed that all the treatments exhibited superiority over control in terms of suppressing the leafhopper incidence; flonicamid 50WG @ 100g.a.i./ ha resulted in 89.37% reduction over control followed by tolfenpyrad 20SC @ 200g.a.i./ ha with 81.92% reduction. After three sprays the treatments again, flonicamid and tolfenpyrad were the best followed by thiamethoxam 25WDG. The biopesticides *Lecanicillium lecanii* and neemazol 1% resulted in only 46.73 and 41.13% reduction. These results are similar to those of Sunil et al. (2019) that biopesticides *Metarhizium anisopliae* 1.15 WP and NSKE (Neem Seed Kernel Extract) were the least effective. Flonicamid 50WG was found to result in 93.5% reduction in leafhoppers (Duraimurugan and Alivelu, 2017). Anandmurthy et al. (2017) showed that flonicamid 50 WG @ 0.02% gave efficient leafhopper mortality with two sprays. Ram et al. (2020)

Table 1. Efficacy of insecticides and biopesticides against *E. kerri* in pigeonpea

Treatment	Dosage	Leaf hoppers / 3 top leaflets Pretreatment	15 Days after first application	15 Days after second application	15 Days after third application	% reduction over control after third application	Visual symptom (1-5 Scale)	Yield (q/ ha)
Lecanicillium lecanii	2 g/ l	25.27	19.80	10.27	5.47	46.73	4.67	9.10
		(5.08)	(4.51)	(3.28)	(2.44)			
Bufrofezin 20SC	200 g.a.i./ ha	23.60	10.87	4.47	1.87	58.16	2.33	10.30
		(4.91)	(3.37)	(2.23)	(1.54)			
Neemazol 1%	2 ml/l	28.43	18.40	14.27	8.40	41.13	4.67	9.90
		(5.38)	(4.35)	(3.84)	(2.98)			
Flonicamid 50WG	100 g.a.i./ ha	27.51	8.20	1.60	0.17	89.37	1.33	13.20
		(5.29)	(2.95)	(1.45)	(0.82)			
Tolfenpyrad 20%SC	200 g.a.i./ ha	24.60	10.03	2.60	0.47	81.92	1.67	12.40
		(5.01)	(3.24)	(1.76)	(0.98)			
Fipronil 5EC	50 g.a.i./ ha	25.80	12.20	5.27	1.93	63.37	2.33	10.40
		(5.13)	(3.56)	(2.40)	(1.56)			
Thiamethoxam 25WDG	50 g.a.i./ ha	21.00	9.67	1.80	0.33	81.66	1.33	12.90
		(4.64)	(3.19)	(1.52)	(0.91)			
Acephate 75SP	750 g.a.i./ ha	24.20	15.27	7.20	4.00	44.44	2.67	10.90
		(4.97)	(3.97)	(2.77)	(2.12)			
Dimethoate 30EC	600 g.a.i./ ha	27.33	13.67	5.40	1.80	66.66	2.00	11.30
		(5.28)	(3.76)	(2.43)	(1.52)			
Monocrotophos 36SL	360 g.a.i./ ha	24.47	14.40	7.80	3.80	51.28	2.67	10.60
		(5.00)	(3.86)	(2.88)	(2.07)			
Untreated control		24.00	26.40	28.03	29.60		5.00	8.25
		(4.95)	(5.19)	(5.34)	(5.49)			
	C.D (p=0.05)	NS	0.32	0.39	0.24			0.51
	S. Em±	0.28	0.11	0.13	0.08			0.17
	CV (%)	15.20	18.41	13.45	14.66			16.33

*- Values in parentheses arc sine values

also reported that thiamethoxam 25% WG (0.5 g/ l) reduced leafhoppers after 7 days of spray. The results on the yield indicated that maximum pod yield was obtained with flonicamid 50WG and thiamethoxam 25WDG (13.20 and 12.90 q/ ha, respectively). These results on yield are in accordance with those of Anandmurthy et al. (2017). Chaudhari et al. (2015) also reported increased yield with flonicamid 50WG in Indian bean. Sunil et al. (2019) in groundnut found that thiamethoxam 25WG has shown good yield. Ram et al. (2020) with thiamethoxam 25% WG observed more yields (Table 1).

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