EFFICACY OF INSECTICIDES AGAINST WHITE WOOLLY APHID, *CERATOVACUNA LANIGERA*, ZEHNTNER ON SUGARCANE

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Abstract: Seven insecticides were screened on 11 months old sugarcane crop (Co 6907) at Regional Sugarcane and Rice Research Station, Rudrur during 2008-09 and 2009-10. All the treatments showed significant reduction of woolly aphid incidence over the control. Among the insecticides tested, Acephate 75 SP @ 1 g/l of water was found to be effective in reducing the per cent incidence of woolly aphid from 93 to 6 followed by Imidachloprid 200 SL @ 0.25 ml/l of water from 93 to 10 per cent. Observations recorded on sucrose and purity per cent revealed that all the treatments were significantly superior to the control. Among the insecticides tested, highest sucrose and purity per cent was recorded in Acephate 75 SP @ 1 g/l and Imidachloprid 200 SL @ 0.25 ml/l of water (19.05 and 92.14) respectively.

Introduction: In the sugarcane fields of Maharashtra and Karnataka in India, a serious outbreak of sugarcane woolly aphid (*Ceratovacuna lanigera*) in 2002 resulted in up to 30 per cent losses in sugar yields. Usually restricted to the northern parts of India, Orissa and Assam, the pest spread south, becoming a major constraint to production in the region, which provides one-third of India's sugar (4). In Andhra Pradesh its first occurrence was noticed in Bobbili area of Krishna district during 1995. Of late, it is noticed in all parts of state occurring sporadically. During 2003 its incidence noticed in patches but in severe intensity in the factory zone of Medak & Nizamabad district. Infestation of aphid on the underside of leaves causes a characteristic white coating, which is often accompanied by the development of sooty mould from the aphids' honeydew secretions. Blackening of the leaves consequently affects photosynthesis and results in stunting. In addition, farmers become greatly concerned for their own health and are reluctant to harvest infected canes. Broader-leaved varieties tend to be more affected than narrow-leaved cultivars, but most sugarcane varieties have proved susceptible to the pest, with yield losses of up to 30 per cent in severe infestations (1). Neighbouring fields of maize and Napier grass can also be affected. Although natural enemies of the woolly aphid occur in the north, where the pest is usually distributed, these beneficial populations spread more slowly than the pest and thus had little impact (6).

Material & Methods: The field testing of insecticides (Malathion 50 EC, Endosulfan 35 EC, Imidachloprid 200 SL, Monocrotopho 36 SL, Chlorpyriphos 20 EC, Acephate 75 SP and Dimethioate 30 EC) was undertaken at Regional Sugarcane and Rice Research Station, Rudrur during 2008-09 and 2009-10.The experiment was laid out in randomized block design with eight treatments and three replications. The size of the each block in 8 m x 9 m and 1 m space was left from 15 days after spraying indicating the pest between the blocks to avoid observations in drifted area. Five plants were selected randomly and labeled in each treatment. Before spraying, the total number of woolly aphids on 2.5 cm^2 area of top, middle and bottom leaves were counted and recorded. The spraying was done by using foot sprayer. The observations on per cent incidence of sugarcane woolly aphid at one, seven and fifteen days after spraying were recorded. Later the data were analyzed statistically (5). The pooled data of two years studies on effect of different insecticides on sugarcane woolly aphid *Ceratovacuna lanigera*, Zehntner under field conditions before and after spraying are presented in Table 1.

Results And Discussion: Efficacy of seven insecticides viz. (Malathion 50 EC, Endosulfan 35 EC, Imidachloprid 200 SL, Monocrotophos 36 SL, Chlorpyriphos 20 EC, Acephate 75 SP and Dimethioate 30 EC) were tested on 11 months old sugarcane crop (Co 6907) at Regional Sugarcane and Rice Research Station, Rudrur during 2008-09 and 2009-10. The pooled data is presented in tables 1 and 2. All the treatments tested have reduced significantly the woolly aphid incidence over the control. One day before spraying there was no significant difference among the treatments in per cent incidence of white woolly aphid.One day after spraying lowest per cent incidence was recorded in Acephate 75 SP @ 1 gm/litre of water (6.00 per cent) followed by Monocrotophos 36 SL @ 1.6 ml per litre of water (11.33 per cent) At seven and fifteen days after spraying, Acephate 75 SP @ 1 gm/litre of water was found to be effective. The per cent incidence of woolly aphid recorded was 5.6 and 6.00 per cent respectively followed by Imidachloprid 200 SL @ 0.25 ml/lt of water which recorded the incidence of 12.33 and 10.00 per cent respectively. In the treatments, Malathion 50 EC and Monocrotophos 36 SL though the incidence of sugarcane woolly aphid was reduced at one days after spraying but the incidence slightly increased resurgence. However, Endosulfan 35 EC,

Imidachloprid 200 SL, Chlorpyriphos 20 EC and Dimethioate 30 EC, incidence reduced from one day after sraying to fifteen day after spraying. Observations recorded on sucrose and purity per cent revealed that all the treatments were significantly superior over the control. Among the insecticides tested highest sucrose and purity per cent was recorded in Acephate 75 SP @ 1 gm/litre and Imidachloprid 200 SL @ 0.25 ml per litre of water (19.05 and 92.14) respectively. Highest yield and number of millable canes per hectare was recorded in Acephate 75 SP but statistically there was no significant difference among the treatments.The present findings are in agreement with the observations of Kulkarni (2003) who reported that dimethoate, methyl dematon and acephate are effective in controlling sugarcane woolly aphid. Similarly, (3) advocated application of diamethoate after June for control *Certovacunal Lanigera* without harming natural enemies. Among the insecticides tested Acephate 75 SP @ 1 gm/litre of water was found to be effective in reducing the per cent incidence of woolly aphid from 93 to 6 per cent followed by Imidachloprid 200 SL @ 0.25 ml/lt of water which reduced the incidence from 93 to 10 per cent.

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Table 1: Efficacy of different insecticides against sugarcane woolly aphid

Sl. No.	Treatments	No. of Sugarcane woolly aphids per 2.5 cm^2	Per cent incidence of white wooly aphid *Ceratovacuna lanigera*, Zehntner				Sucrose per cent	Purity per cent	Number of millable canes / ha	Yield (t/ha)
			1DBS	1DAS	7DAS	15DAS				
1.	Malathion 50 EC @ 2 ml/l	40.00	92.37 (69.21)	14.67 (8.43)	13.00 (7.66)	17.33 (9.98)	14.74	85.19	73542	82.67
2.	Endosulfan 35 EC @2 ml/l	39.90	86.63 (64.84)	21.67 (12.51)	16.00 (9.20)	14.00 (8.04)	17.32	89.67	76875	84.75
3.	Imidachloprid 200 SL @ 0.25 ml/l	48.00	93.00 (68.12)	14.33 (8.21)	12.33 (7.08)	10.00 (5.74)	19.05	92.14	80000	87.04
4.	Monocrotophos 36 SL @ 1.6 ml/l	45.60	91.66 (66.49)	11.33 (8.24)	15.33 (8.82)	14.00 (8.04)	17.83	91.17	78236	87.56
5.	Chlorpyriphos 20 EC @ 2.5 ml/l	40.60	90.66 (66.94)	22.67 (13.10)	21.33 (12.32)	12.00 (6.89)	15.25	84.98	75652	83.21
6.	Acephate 75 SP@ 1 gm/l	40.50	93.00 (68.46)	6.00 (3.43)	5.67 (3.24)	6.00 (3.43)	19.05	92.14	80625	89.22
7.	DimethioatE 30 EC @ 2 ml/l	38.50	94.00 (66.94)	22.00 (13.71)	23.33 (13.50)	17.67 (10.17)	15.49	86.39	75833	83.16
8.	Control	45.00	93.66 (69.69)	93.00 (68.46)	93.33 (69.04)	91.67 (66.49)	13.98	83.79	60167	77.55
	F test		Non sig.	Sig.	Sig.	Sig.	Sig	Sig	N.S	N.S
	CD		-	2.46	3.37	2.64	2.86	4.92	-	-
	CV%		4.721	8.44	11.8	10.16	9.86	3.19	9.4	4.6

Figures in the parenthesis are Arc sine transformed values ; DBS: Days before spraying.; DAS: Days after spraying.

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