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Management of insect pests of sponge gourd under poly house conditions

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Abstract
Insecticides *viz.*, dichlorvos 76 EC (1ml/litre water), dimethoate 30 EC (1ml/litre water), imidacloprid 17.8 SL (0.45 ml/ litre water), imidacloprid 17.8 SL (0.3 ml/ litre water), imidacloprid 17.8 SL (0.15 ml/ litre water), chlorpyriphos 20 EC (1ml/litre water) and neem oil (2ml/litre water) were evaluated against white fly and melon aphid of sponge gourd under poly house conditions in 33rd and 35th standard week. Higher dose of imidacloprid 17.8 SL (0.45ml) was most effective in reducing population of white fly and melon aphid and increasing mortality (89.03% and 88.15%) after two sprays on sponge gourd respectively. Imidacloprid 17.8 SL (0.3ml) and dimethoate 30 EC (1ml) recorded mortality percentage of 75.21 and 75.05 (white fly) and 78.02 and 77.75 (melon aphid). These insecticides were at par with each other but significantly different from imidacloprid 17.8 SL (0.45 ml), dichlorvos 76 EC (1ml), chlorpyriphos 20 EC (1 ml), imidacloprid 17.8 SL (0.15 ml) and neem oil (2 ml) recorded mortality percentage 60.75, 54.73, 36.02 and 34.81 (white fly) and 69.58, 63.62, 45.88 and 36.60 (melon aphid), respectively. These treatments were significantly different from other treatments and were superior over control.

Keywords: white fly, melon aphid, sponge gourd, protected cultivation, management

Introduction
Cucurbits, a common name given to a number of vegetable crops belonging to the cucurbitaceae botanical family, which mostly have a trailing habit, are widely grown in tropical and sub-tropical countries and comprise the largest number of vegetables in the summer and rainy season. Sponge gourd (*Luffa cylindrica* Roem.) belongs to family cucurbitaceae, having diploid chromosome number 2n =26, originated in sub-tropical Asia region particularly India (Kalloo, 1993) [3]. Cucurbits are generally cultivated both in open fields and under protected conditions. Protected cultivation under poly houses is becoming increasingly necessary these days. It proves to be beneficial to farmers as it allows off-season cultivation and enables farmers to achieve better prices, extended crop life cycles, and managed crop environments. Polyhouses are usually known to be free of pests and diseases, since they serve as a physical barrier to the spread of these species. Various constructional flaws and the use of infested planting materials, however, facilitate the entry of pests into the protected structures. The congenial micro-climate is favourable for the multiplication of pests which in turn become the limiting factor for the successful crop production under protected environment (Kaur *et al.*, 2010) [4]. No attempts have been made in Kashmir to monitor sponge gourd insect pests under protected conditions. Therefore, the current investigation was conducted to establish the efficient and economical management under protected conditions of sponge gourd insect pests.

Materials and Methods
The present studies were conducted at FoA, SKUAST-K Wadura, situated at an altitude of 1610 meters above mean sea level between 34°20' North Latitude and 74°24' East longitude. The seeds were sown in poly bags and placed in poly house and were planted in poly house as per the package of practices recommended by SKUAST-K after emergence from the polybags. The distance from row to row and plant to plant was maintained at 1.5 m x 1 m, respectively. For the control of aphid and white fly on sponge gourds, two sprays of various insecticides were carried out.

All the insecticides were sprayed at their respective recommended doses, however, imidacloprid 17.8 SL was applied at three doses (0.45 ml, 0.3 ml and 0.15 ml/litre of water). There were eight treatments including control (water) and each treatment was replicated thrice. The insecticides were applied at peak infestation (1st spray) followed by another treatment (2nd spray) 14 days after first application. The data on population per leaf and mortality percentage of aphids and white flies on sponge gourd was recorded on 1, 3, and 7 days after treatment (DAT). Data produced during the analysis on each experiment was analysed using appropriate analytical methods (Gomez and Gomez, 1984 and OP STAT). On the basis of critical differences, effective transformations were made and results were compared.

Results and Discussion

The data on mortality percentage of white fly on sponge gourd under poly house conditions after two sprays revealed that highest mortality (78.8% and 61.7%) was observed with higher dose of imidacloprid 17.8 SL (0.45 ml) on 1 DAS. Highest mortality was also observed with same dose of imidacloprid after 3 and 7 days of its application as compared to other treatments (Table 1 and 2). All the treatments were superior over control in increasing the mortality percentage. These results are broadly supported by the findings Kumar and Shankar (2017) [17] who found that imidacloprid 20 SL @ 100-125 ml (recommended dose) is most effective against white fly after two sprays. Our findings are also confirmed by the reports of Dey *et al.* (2005) [1] in which imidacloprid 20 SL was found significantly effective against sucking pest complex of okra with two sprays at the same dose. Similarly, the data on mortality percentage of melon aphids on application of insecticides on sponge gourd under poly house conditions after two sprays revealed that there was significant increase in mortality of aphid in sponge gourd on 1, 3 and 7 days after two sprays (DAS) of insecticides. The highest mortality (77.5% and 73.6%) was observed with higher dose of imidacloprid 17.8 SL (0.45 ml) on 1 DAS. Highest mortality was also observed with same dose of imidacloprid after 3 and 7 days of its application. (Table 3 and 4). Nemade *et al.* (2017) also recorded minimum population of aphids in cotton at higher dose (double than recommended dose) of imidacloprid 17.8 SL thus clearly indicating the higher efficacy of these doses over recommended doses. The pooled data on mortality percentage of white fly and melon aphid on sponge gourd revealed that all the treatments were significantly superior over control (water). Imidacloprid 17.8 SL (0.45 ml) was found most effective in reducing white fly and melon aphid population and increasing mortality percentage after two sprays (Table 5).

Table 1: Mortality percentage of whitefly (*Trialeurodes vaporariorum*) on sponge gourd after 1st spray under polyhouse conditions.

Treatment	Concentration (%)	Dosage /litre water (ml)	Pre-count (No./leaf)	Mortality (%)			Cumulative mean
				1 DAS	3 DAS	7 DAS	
Dichlorvos 76 EC	0.076	1.0	4.77	*55.4 **(48.08)d	58.8 (50.05)d	66.3 (54.54)d	60.16
Dimethoate 30 EC	0.030	1.0	5.00	70.8 (57.33)ab	79.1 (62.82)b	80.3 (63.68)b	76.73
Imidacloprid 17.8 SL	0.008	0.45	4.57	78.8 (62.61)a	93.7 (75.48)a	100.0 (90.00)a	90.83
Imidacloprid 17.8 SL	0.005	0.30	4.57	70.5 (57.11)abc	78.7 (62.52)bc	80.2 (63.57)bc	76.46
Imidacloprid 17.8 SL	0.002	0.15	5.13	46.0 (42.72)def	47.9 (43.03)f	50.3 (44.84)f	37.73
Chlorpyriphos 20 EC	0.02	1.0	5.47	51.3 (45.74)de	51.8 (45.96)e	58.1 (49.64)e	53.4
Neem oil	0.03	2.0	4.57	34.3 (35.79)fg	34.7 (36.09)g	38.6 (38.38)g	35.86
Control (water)		-	5.00	0.0 (0.7)h	0.0 (0.7)h	0.0 (0.7)h	0.0
C.D. ($p \leq 0.05$)				8.43	1.62	1.10	

*Mean of 3 replications, DAS = Days after spray
**The values in parenthesis are arc sine transformed values

Table 2: Mortality percentage of whitefly (*Trialeurodes vaporariorum*) on sponge gourd after 2nd spray under polyhouse conditions.

Treatment	Concentration (%)	Dosage /litre water (ml)	Pre-count (No./leaf)	Mortality (%)			Mean
				1 DAS	3 DAS	7 DAS	
Dichlorvos 76 EC	0.076	1.0	2.7	*43.1 **(41.02)d	56.2 (48.54)d	84.7 (66.95)d	61.33
Dimethoate 30 EC	0.030	1.0	2.2	54.6 (47.64)abc	77.9 (61.94)bc	87.6 (69.39)bc	73.36
Imidacloprid 17.8 SL	0.008	0.45	0.9	61.7 (51.77)a	100.0 (90.00)a	100.0 (90.00)a	87.23
Imidacloprid 17.8 SL	0.005	0.30	2.0	55.0 (47.89)ab	78.3 (62.23)b	88.6 (70.31)b	73.96
Imidacloprid 17.8 SL	0.002	0.15	3.7	13.8 (21.77)fg	35.7 (36.71)f	53.4 (46.94)f	34.3
Chlorpyriphos 20 EC	0.02	1.0	3.7	34.5 (35.97)de	52.0 (46.16)de	81.7 (64.66)de	56.06
Neem oil	0.03		4.3	21.2	34.4	45.8	33.76

		2.0		(27.41)f	(35.91)fg	(42.59)g	
Control (water)		-	5.0	2.9 (5.71)h	1.0 (3.26)h	1.9 (6.53)h	1.93
C.D. ($p \leq 0.05$)				6.14	3.65	3.71	

*Mean of 3 replications, DAS = Days after spray
**The values in parenthesis are arc sine transformed values

Table 3: Mortality percentage of melon aphid (*Aphis gossypii*) on sponge gourd after 1st spray under poly house conditions.

Treatment	Concentration (%)	Dosage /litre water (ml)	Pre-count (No./leaf)	Mortality (%)			Cumulative Mean
				1 DAS	3 DAS	7 DAS	
Dichlorvos 76 EC	0.076	1.0	20.67	*60.6 **(51.12)d	76.1 (60.75)d	76.7 (60.91)d	71.13
Dimethoate 30 EC	0.030	1.0	20.47	71.1 (57.50)b	81.1 (64.20)b	84.6 (66.86)b	78.93
Imidacloprid 17.8 SL	0.008	0.45	19.67	77.5 (61.69)a	85.9 (67.97)a	91.9 (73.47)a	85.1
Imidacloprid 17.8 SL	0.005	0.30	20.43	71.1 (57.50)bc	80.1 (63.49)bc	84.5 (66.84)bc	78.56
Imidacloprid 17.8 SL	0.002	0.15	20.20	34.3 (35.85)f	50.2 (45.09)g	56.1 (48.52)g	46.86
Chlorpyriphos 20 EC	0.02	1.0	19.00	50.9 (45.52)e	64.0 (53.11)e	73.2 (58.85)e	62.7
Neem oil	0.03	2.0	20.20	31.2 (33.97)fg	55.4 (48.07)f	63.6 (52.91)f	50.06
Control (water)		-	20.53	1.2 (5.13)h	0.0 (0.7)h	0.0 (0.7)h	0.4
C.D. ($p \leq 0.05$)				3.07	0.93	0.78	

*Mean of 3 replications, DAS = Days after spray
**The values in parenthesis are arc sine transformed values

Table 4: Mortality percentage of melon aphid (*Aphis gossypii*) on sponge gourd after 2nd spray under poly house conditions.

Treatment	Concentration (%)	Dosage /litre water (ml)	Pre-count (No./leaf)	Mortality (%)			Cumulative Mean
				1 DAS	3 DAS	7 DAS	
Dichlorvos 76 EC	0.076	1.0	10.3	*50.6 **(45.34)d	75.1 (60.09)d	78.4 (62.33)d	68.03
Dimethoate 30 EC	0.030	1.0	6.0	54.8 (47.75)bc	86.3 (68.25)b	90.2 (71.74)b	77.1
Imidacloprid 17.8 SL	0.008	0.45	4.1	73.6 (59.10)a	100.0 (90.00)a	100.0 (90.00)a	91.2
Imidacloprid 17.8 SL	0.005	0.30	5.9	55.0 (47.85)b	85.7 (67.81)bc	90.1 (71.66)bc	76.93
Imidacloprid 17.8 SL	0.002	0.15	13.0	20.6 (27.02)f	45.1 (42.19)f	69.0 (56.14)def	44.9
Chlorpyriphos 20 EC	0.02	1.0	8.5	43.8 (41.44)e	72.1 (58.09)de	77.7 (61.80)de	64.53
Neem oil	0.03	2.0	13.0	11.7 (19.94)g	24.4 (29.61)g	33.3 (35.24)g	23.13
Control (water)		-	20.5	0.2 (1.57)h	3.7 (6.48)h	11.0 (15.95)h	4.96
C.D. ($p \leq 0.05$)				1.99	6.9	8.59	

*Mean of 3 replications, DAS = Days after spray
**The values in parenthesis are arc sine transformed values

Table 5: Pooled mortality (%) of whitefly (*Trialeurodes vaporariorum*) and melon aphid (*Aphis gossypii)* after two sprays on sponge gourd.

Treatment details	Concentration (%)	Dosage /litre water (ml)	Pooled data after two sprays					
			Mortality (%)			Mortality (%)		
			1st spray	2nd spray	Pooled mean	1st spray	2nd spray	Pooled mean
Dichlorvos 76 EC	0.076	1.0	60.16	61.33	60.75	71.13	68.03	69.58
Dimethoate 30 EC	0.030	1.0	76.73	73.36	75.05	78.93	77.1	78.02
Imidacloprid 17.8 SL	0.008	0.45	90.83	87.23	89.03	85.1	91.2	88.15
Imidacloprid 17.8 SL	0.005	0.30	76.46	73.96	75.21	78.56	76.93	77.75
Imidacloprid 17.8 SL	0.002	0.15	37.73	34.3	36.02	46.86	44.9	45.88
Chlorpyriphos 20 EC	0.02	1.0	53.4	56.06	54.73	62.7	64.53	63.62
Neem oil	0.03	2.0	35.86	33.76	34.81	50.06	23.13	36.60
Control (water)		-	0.0	1.93	0.97	0.4	4.96	2.68

Conclusion

Among different insecticides used for the management of white fly and melon fly on sponge gourd under poly house conditions, higher dose of imidacloprid 17.8 SL (0.45ml) proved superior to other insecticides and control after two sprays (33rd and 35th standard week). However, two sprays of imidacloprid 17.8 SL (0.3ml) and dimethoate 30 EC (1ml) also provided efficient control of these pests and therefore, shall be preferred by considering the population of natural enemies.

References

1. Dey PK, Jana SK, Chakraborty G, Somchoudhury AK. Evaluation of imidacloprid (70 WS and 20 SL) against sucking pest complex of okra, *Abelmoschus esculentus.* Journal of Entomological Research 2005;29(3):215-218.
2. Gomez KA, Gomez AA. Statistical procedures for agricultural research. 2nd edition. Jhon Wiley and Sons, New York 1984, 316-356.
3. Kalloo G. *Loofah-luffa* species. In: Genetic improvement of Vegetable Crops. Pergamon Press, London, UK. 1993, 265-266.
4. Kaur S, Kaur S, Srinivasan R, Cheema DS, Lal T, Ghai TR *et al*. Monitoring of major pests on cucumber, sweet pepper and tomato under net-house conditions in Punjab, India. Pest Management in Horticultural Ecosystems 2010;16(2):148-155.
5. Kumar A, Shankar U. Management of whitefly on cucumber, *Cucumis sativus* in Jammu climatic region (J&K) India. Trends in Biosciences 2017;10(36):7510-7513.
6. Nemade PW, Budhvat KP, Wadaskar PS. Population dynamics of sucking pests with relation to weather parameters in *bt* cotton in Buldana District, Maharashtra, India. International Journal of Current Microbiology and Applied Science 2018;7(1):620-626.