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Efficacy of various insecticide against *Bemisia tabaci,* (gennadius) on chrysanthemum under polyhouse condition

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Abstract
Outcome of experiment clearly indicated that all the evaluated insecticidal treatments were significantly superior over the untreated control in suppressing the whitefly population on chrysanthemum under polyhouse conditions. Among the various insecticides tested, Imidacloprid 17.8 SL emerged as the most effective treatment, exhibiting the highest degree of whitefly suppression throughout the period of observation and thereby indicating its superior efficacy against *Bemisia tabaci*. Thiamethoxam 25 WG was found to be the next most effective treatment and also recorded a substantial reduction in whitefly population. It was followed by Acetamiprid 20 SP and Buprofezin 25 SC, both proved effective in minimizing whitefly incidence by maintaining comparatively lower pest populations. In contrast, Profenophos 50 EC recorded a relatively higher whitefly population as compared to the other insecticidal treatments, thereby reflecting its comparatively lower effectiveness in the management of whitefly infestation under polyhouse conditions.

Keywords: Chrysanthemum, insecticide, whitefly, polyhouse

Introduction
Chrysanthemum is believed to be native to the Northern hemisphere, specifically Europe and Asia. It is originated in China (Bose *et al*. 2002). Chrysanthemum is considered to be second most important floricultural crop worldwide In India it has been recognized as one of the five commercially important flower crops (Janakiram *et.al.*, 2006). Among the whole factor influencing flower output and quality, insect pest infestation is one of the most critical, reducing both yield quality and quantity. Under polyhouse cultivation, chrysanthemum provides a highly favorable microclimate for the rapid multiplication of whitefly, *B. tabaci* Genn., often leading to severe and persistent infestations. Iinsecticides are one of the strategies that have been investigated to stop *B. tabaci Genn.* attacks. Therefore, detailed information on performance of insecticides in a polyhouse environment is essential to manage whitefly.

Materials and Methods
Experiment was conducted at Main Sugarcane Research Station poly house, Navsari Agricultural University, Navsari, Gujarat. Chrysanthemum variety Ajina purple was selected for Experiment and recommended agronomical practices wear carried out. Chemical insecticides sprayed two times, first spray at initiation of whitefly population and second spray 15 days after 1st spray during crop season. Treatments repeated five times. In order to evaluate the efficacy of different insecticides, observation on number of whiteflies from randomly selected three leaves from top, middle and lower plant part was recorded one day before first spray and then after 1, 3, and 7 days after treatment. Total number of whiteflies were recorded from five repetition and each treatment and obtained data was statistically analyzed by using Completely Randomized Design (CRD).

Table 1: Details of insecticides along with their concentration used against whitefly *B. tabaci.*

Treatment	Insecticides	Concentration (%)	Dose (ml or g)/10 l. of water
T_1	Thiamethoxam 25% WG	0.01	4gm
T_2	Acetamiprid 20% SP	0.01	5gm
T_3	Buprofezin 25% SC	0.05	20gm
T_4	Imidacloprid 17.8 %SL	0.005	3ml
T_5	Profenophos 50 %EC	0.5	20ml
T_6	Control	-	-

Results and Discussion
A result of management of whiteflies through insecticides, namely Thiamethoxam, Acetamiprid, Buprofezin, Imidacloprid, and Profenophos depicted in tables 2-3 and illustrated figures 1-2. The performance of insecticidal treatments was evaluated based on their ability to suppress whitefly population at
different intervals following each application. The comparative effectiveness of the insecticides was determined by analyzing the reduction in whitefly population over the untreated control. The results obtained from successive observations provide a comprehensive understanding of the relative efficacy of the tested insecticides in managing whitefly infestation.

Number of whiteflies before spray
Observations recorded one day prior to insecticidal application indicated that the whitefly population (based on

three leaves per plant) remained comparable across all treatments. The population varied between 6.16 and 6.94 (Table 2) whiteflies per three leaves per plant, and the differences among treatments were statistically non-significant. This indicates that the experimental plots were uniform with respect to initial pest incidence before the imposition of treatments.

One days after 1st spray

Observations recorded at 1 DAS (Table 2) revealed that all insecticidal treatments resulted in a significantly lower whitefly population range from 1.04 to 4.04 whiteflies per three leaves compared to the untreated control having 6.28. The treated plots exhibited a marked reduction in pest incidence, indicating the effectiveness of the applied insecticides at the initial stage following application. Among the treatments, Imidacloprid 17.8 SL was found to be significantly superior in reducing the whitefly population, recording 1.04 whiteflies per three leaves. This was followed by Thiamethoxam 25 WG recording 1.28 whiteflies per three leaves, which was statistically at par with Buprofezin 25 SC recording 2.76 whiteflies per three leaves. The next effective treatments were Acetamiprid 20 SP and Profenophos 50 EC, recording 2.92 whiteflies per three leaves per plant and 4.04 whiteflies per three leaves, respectively. The highest whitefly population was observed in the untreated control, registering 6.28 whiteflies per three leaves.

Three days after 1st spray

The whitefly population recorded three days after the application of different insecticides, as presented in Table 2 and illustrated in Figure 1, revealed that all treatments resulted in a significant reduction in whitefly population over the untreated control. The whitefly population on 3rd day in different treatments ranged from 0.96 to 3.08 per three leaves per plant as compared to 6.64 per three leaves in untreated control. Imidacloprid 17.8 SL was superior to all other insecticidal treatments in reducing the whitefly population (0.96 / three leaves). It was statistically at par with Thiamethoxam 25 WG treatment (1.12 / three leaves). The next treatment reducing the whitefly population is Acetamiprid 20 SP (1.64/ three leaves) and Buprofezin 25 SC (1.68/ three leaves). Profenophos recorded a comparatively higher whitefly population (3.08/three leaves) than the other insecticidal treatments, indicating its relatively lower efficacy.

Table 2: Efficacy of insecticides against whitefly on chrysanthemum after first spray

Sr. No.	Treatments	Dose (ml or g)/10 lit of water	Mean no. of whitefly per 3 leaves				Pooled over mean
			DAS				
			BS	1	3	7	
T1	Thiamethoxam 25 WG	4gm	6.44 (2.63)	1.28 (1.33)	1.12 (1.27)	1.20 (1.33)	1.23 (1.33)
T2	Acetamiprid 20 SP	4gm	6.94 (2.72)	2.92 (1.84)	1.64 (1.46)	1.60 (1.44)	2.05 (1.71)
T3	Buprofezin 25 SC	20ml	6.48 (2.64)	2.76 (1.79)	1.68 (1.47)	1.56 (1.43)	2.00 (1.67)
T4	Imidacloprid 17.8 SL	3ml	6.16 (2.57)	1.04 (1.23)	0.96 (1.20)	1.22 (1.30)	1.07 (1.26)
T5	Profenophos 50 EC	20ml	6.60 (2.66)	4.04 (2.13)	3.08(1.89)	3.36(1.96)	3.49 (2.08)
T6	Control	-	6.56 (2.65)	6.28 (2.60)	6.64 (2.66)	6.56 (2.65)	6.49 (2.62)
SEm (±)			0.07	0.05	0.04	0.05	
C. D. at5%			NS	0.15	0.11	0.15	
CV			5.60	5.74	5.01	6.07	

*Figures in parentheses are original values and those outside are square root transformed values
BS- Before spray DAT- Days after treatment NS- Non-significant
In each column means followed by the same alphabet are statistically at par with each other DNMRT has been used

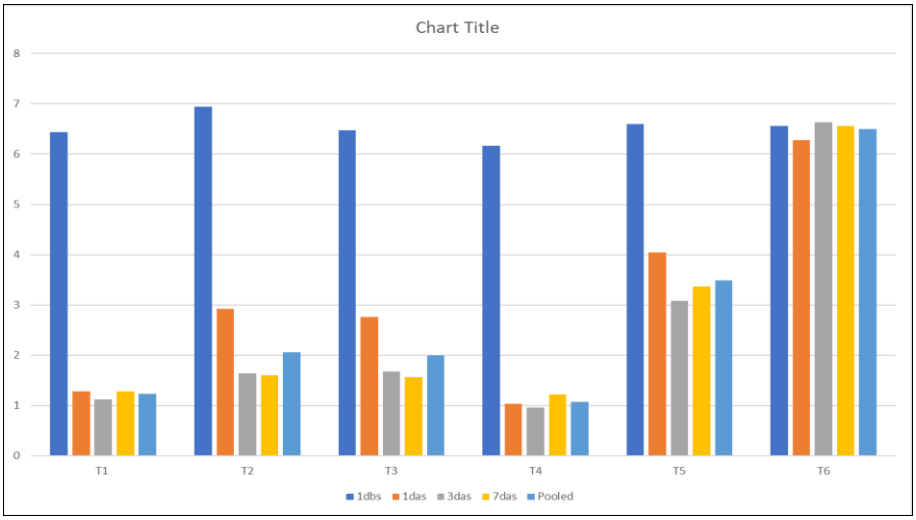

Fig. 1: Efficacy of different insecticides in managing whitefly population on chrysanthemum after first spray

Seven days after 1st spray

The whitefly population treated with different insecticides ranged from 1.22 to 3.36 individuals per three leaves, as compared to 6.56 whiteflies per three leaves recorded in the untreated control. Imidacloprid 17.8 SL applied emerged as the most efficacious treatment in suppressing the whitefly population (1.22/ three leaves), recording the lowest pest incidence among all treatments. Its performance was statistically comparable (at par) with Thiamethoxam 25 WG (1.28/ three leaves) indicating a similar level of

effectiveness between the two treatments. In contrast, Profenophos (3.36/ three leaves) exhibited comparatively poor performance and was found to be the least effective in managing the whitefly population. The untreated control recorded the highest whitefly population compared to all insecticidal treatments.

Insecticidal management of whitefly (*Bemisia tabaci*) under polyhouse after second spray.

Before spray

A significant variation in adult whitefly population per leaf was observed among the treatments prior to treatment application. The initial population levels ranged between 2.56 and 7.64 adults per leaf, as presented in Table 2.

One days after 2nd spray

The observations recorded at 1 DAS revealed that the whitefly population in different treatments ranged from 0.38

to 2.32 whiteflies per three leaves. All insecticidal treatments were found to be significantly superior to the untreated control in reducing the whitefly population. The results clearly indicated that the second application of insecticidal treatments led to a marked reduction in whitefly population across all treated plots, demonstrating enhanced efficacy of the treatments upon repeated application. Imidacloprid 17.8 SL was the most effective treatment, recording the lowest whitefly population (0.38 per three leaves). It was followed by Thiamethoxam 25 WG (0.6 per three leaves), Next treatment Buprofezin 25 SC (2.32 per three leaves). Acetamiprid 20 SP and Profenophos 50 EC showed moderate effectiveness (1.52 and 2.24) while the untreated control had the highest population (8.16 per three leaves)

Three days after 2nd spray

All insecticidal treatments significantly reduced the whitefly population compared to the untreated control at 3 days after the second spray (Table 3; Fig. 2). The population ranged from 0.08 to 1.28 whiteflies per three leaves, with the highest incidence recorded in the control. Among the treatments, Imidacloprid 17.8 SL was the most effective, and remaining statistically at par with Thiamethoxam 25 WG and Buprofezin 25 SC. Acetamiprid 20 SP and Profenophos 50 EC ranked next in effectiveness, while Profenophos 50 EC showed poor performance in controlling the whitefly population in chrysanthemum plants.

Table 3: Efficacy of insecticides against whitefly on chrysanthemum after second spray

Sr. No.	Treatments	Dose (ml or g)/10 lit of water	Mean no. of whitefly per 3 leaves				
			BS	DAS			Pooled over mean
				1	3	7	
T1	Thiamethoxam 25 WG	4gm	2.56 (1.74)	0.6 (1.04)	0.20 (0.83)	0.28 (1.33)	0.36 (0.91)
T2	Acetamiprid 20 SP	4gm	3.68 (2.03)	1.52 (1.42)	0.28 (0.88)	0.36 (1.44)	0.72 (1.07)
T3	Buprofezin 25 SC	20ml	3.32 (1.95)	2.32 (1.34)	0.20 (0.83)	0.32 (1.43)	0.61 (1.02)
T4	Imidacloprid 17.8 SL	3ml	1.76 (1.50)	0.38 (0.92)	0.08 (0.75)	0.26 (1.30)	0.24 (0.84)
T5	Profenofos 50 EC	20ml	4.92 (2.32)	2.24(1.65)	1.28 (1.33)	1.52 (1.96)	1.68 (1.4)
T6	Control	-	7.64 (2.85)	8.16 (2.92)	8.04 (2.92)	8.12 (2.65)	8.10 (2.92)
Sem (±)			0.05	0.04	0.03	0.04	
C. D. at5%			0.15	0.11	0.10	0.11	
CV			5.69	5.65	5.96	6.35	

*Figures in parentheses are original values and those outside are square root transformed values

BS- Before spray DAT- Days after treatment NS- Non-significant

In each column means followed by the same alphabet are statistically at par with each other DNMRT has been used

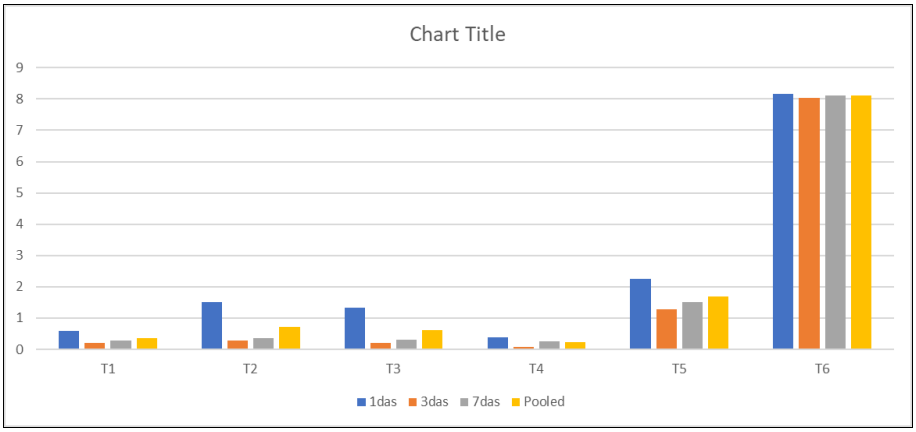

Fig 2: Effect of different insecticides on whitefly population on chrysanthemum after second spray

Seven days after 2nd spray

The whitefly population treated with different insecticides ranged from 0.26 to 1.52 individuals per three leaves, as compared to 8.12 whiteflies per three leaves recorded in the untreated control. By the 7th day after application, a decline in the residual effectiveness of the insecticides against whitefly was evident; however, all treatments remained significantly superior to the untreated control. Imidacloprid

17.8 SL was the most effective, recording 0.26 whiteflies per three leaves. Thiamethoxam 25 WG ranked next and was found to be at par with Buprofezin 25 SC. In contrast, Profenophos 50 EC was the least effective treatment, registering 1.52 whiteflies per three leaves while the untreated control recorded 8.12 whiteflies per three leaves.

The evaluation of insecticides and their respective dosages against whitefly in chrysanthemum revealed that all tested treatments significantly suppressed the pest population as compared to the untreated control. A marked decline in whitefly incidence was evident following each application, with the greatest reduction consistently observed at 3 days and 7 days after spraying (DAS), indicating the period of maximum insecticidal activity. Among the different insecticides, Imidacloprid 17.8 SL applied proved to be the most effective, maintaining the lowest whitefly population throughout the observation period. Thiamethoxam 25 WG ranked next in efficacy. The next best treatment was Buprofezin 25 SC at par with Acetamiprid 20 SP. In contrast, Profenophos 50 EC was comparatively less effective and recorded higher whitefly counts among the treated plots. The observed variation in performance among insecticides may be attributed to differences in their mode of action, systemic movement within plant tissues, and persistence under field conditions. Overall, the findings emphasize the importance of selecting appropriate insecticides with better residual action for sustainable management of whitefly in chrysanthemum.

The findings agree to the reported Habiba *et al* (2022) [2] that imidacloprid were most effective in reducing whitefly population after first and second spray in reducing whitefly. Kar (2017) [3] also reported that the application of imidacloprid 17.8% SL at 175 ml ha-1 was more effective in reduction of whitefly population to obtain higher fruit yield of tomato than its lower doses and thiamethoxam spray. Zhang *et al* (2020) [8] also reported that Cotton seeds treated with imidacloprid and thiamethoxam were effective against *B. tabaci* under laboratory and greenhouse conditions, and up to 2 months under field conditions. Mohammadali *et al* (2019) [4] Foliar spraying of imidacloprid and thiamethoxam were the most efficient at one day after application and the foliar treatment of Actara gave the highest efficacy after 14 days. Sangle *et al* (2017) [5] concluded that the imidacloprid 17.8 SL @ 0.005% (5.12 thrips/3 leaves and 0.96 whiteflies/leaf), acetamiprid 20 SP 0.004% (0.58 whiteflies/leaf) found most effective. Devi *et al* (2015) [1] imidacloprid was found to be the most toxic insecticide followed by acetamiprid, thiamethoxam. Shan *et al* (2023) [6] also reported imidacloprid is highly effective against whitefly.

Conclusion

Among the various insecticides tested, Imidacloprid 17.8 SL exhibiting the highest degree of whitefly suppression throughout the period of observation In contrast, Profenophos 50 EC recorded a relatively higher whitefly population as compared to the other insecticidal treatments.

References

1. Devi N, Sharma KC, Chandel RS. Relative toxicity of some insecticide against greenhouse whitefly Trialeurodes vaporariorum (Hemiptera: Aleyrodidae). Indian Journal of Natitional Sceience,2015:6(31):8791–8796.
2. Habiba R, Singh MK, Abhsiehk BM. Studies on Population Dynamics and Management of Whitefly, Trialeurodes vaporariorum on Chrysanthemum under Polyhouse Conditions. Environment and Ecology,2022:40(4D):2817–2821.
3. Kar A. Bio-efficacy evaluation of 17.8 % imidacloprid and thiamethoxam against whitefly on tomato and their effect on natural enemies. Journal of Entomology and Zoology Studies,2017:5(3):1064–1067.
4. Mohammadali MT, AL Yousuf AA, Baqir HA, Kadhima AA. Evaluation of the efficacy of different Neonicotoids insecticide against cotton whitefly, Bemisia tabci (Hemiptera: Aleyrodidae) on eggplant under greenhouse condition. Earth and Environmental Science,2019:338(1):1–6.
5. Sangle PM, Pawar SR, Antu M, Korat DM. Bio-efficacy studies of newer insecticides against sucking insect pests on chilly, Capsicum annum L. Journal of Entomology and Zoology Studies,2017:5(6):476–480.
6. Shan MI, Bashir MH, Ali RMM, Haq SU, Noor F, Aslam F. Evaluation of insecticides and botanical oils against cotton whitefly *Bemisia tabaci* (Hemiptera: Aleyrodidae). University of Sindh Journal of Animal Sceience,2023:7(4):67–71.
7. Zhang N, He S, Jing P. Insights into the importance of dietary chrysanthemum flower (Chrysanthemum morifolium cv. Hangju)-wolfberry (Lyceum barbarum fruit) combination in antioxidant and anti-inflammatory properties. Food Research International,2019:116:810–818.