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Eco-friendly management of sucking pest complex of chilli, (*Capsicum annuum* L.)

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Abstract
A field experiment was carried out on "Eco-friendly management of sucking pest complex of chilli, (*Capsicum annuum* L.)" during Rabi season of 2022-2023 at Central Experimental Station, Wakawali, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Chemical pesticides are widely used in agriculture to protect crops from pests, but they also have negative impacts on the environment and human health. Whereas, Eco-friendly pest control methods are made from natural substances or microorganisms and are considered more sustainable and better alternative to chemical pesticides. During this experiment total six biopesticides were tested *viz.*, Undi oil @ 5ml/lit, Soap nut Extract @ 80ml/lit, Neem seed kernel extract @ 50ml/lit, Neem oil @ 5ml/lit, *Beauveria bassiana* 2 x 10^8 cfu/g @ 4ml/lit and *Verticillium lecanii* 2x10^8 cfu/g @ 4ml/lit, respectively. All these biopesticides were tested against sucking pests of chilli i.e., whiteflies, thrips and aphids. The result regarding overall mean of the three sprays against whiteflies revealed that the treatment *Verticillium lecanii* 2x10^8 cfu/ml @ 4ml/lit was best treatment for management of whiteflies infesting chilli. In case of chilli thrips, treatment *Beauveria bassiana* 2x10^8 cfu/ml @ 4ml/lit gave effective control of the pest. Whereas, treatment *Verticillium lecanii* 2x10^8 cfu/g was found the best treatment for effective control of aphids infesting chilli.

Keywords: Eco-friendly, sucking pests, chilli, biopesticides

1. Introduction
Vegetable constitutes an important part of our food, which supply vitamins, carbohydrates and minerals needed for a balanced and healthy diet. Among them, Chilli, (*Capsicum annuum* L.) is most economically important and popular vegetable crops grown for its green fruit as vegetable and red fruit as a spice (Yadav *et al.* 2022) [9]. Chilli is grown throughout the year as a cash crop and used in green and red ripe dried stage for its pungency and colour in all culinary preparations of rich and poor alike impart the taste, flavour and colour. In the world, India ranks second in the vegetable production. However, the current level of productivity is quite low as compared to other leading vegetable producing countries. One of the major obstacles to low productivity of vegetable production is the losses brought on by vegetable pests. In case of chilli, there are several factors which are responsible for low yield, but among them insect pests are of prime importance which significantly affects both the quality and quantity of chilli production. The yield losses range between 50 and 90 per cent due to insect pest of chilli (Nelson & Natrajan 1994; Kumar 1995) [7, 6]. Numerous insect pests infest chilli plants, attacking them at different phases of growth.
Primary pests of chili peppers are insects that feed on sap, such as aphids, whiteflies, and thrips. Because chiles are harvested frequently, maintaining an insecticidal layer is both cost-effective and risky. Besides the indiscriminate use of insecticides has eroded sustainability and resulted in the buildup of pesticide residues, resistance to pesticides, resurgence, and the secondary outbreak of these pests. Besides increasing the cost of production, the use of pesticides has negative effect on the environment and human health, which is attributed to high chemical residues. Therefore, using pesticides to control these pests is strongly condemned for a number of reasons, instead, eco-friendly pest management techniques should be used.

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The new compounds must be assessed to ensure that sucking pests are reduced to the lowest possible level while posing the fewest possible risks to plants, consumers, and the environment. The new family of insecticides is more environmentally friendly and easier to apply because of its selective toxicity to insects and safety to natural foes.

2. Materials and Methods

To investigate the effectiveness of various environmentally friendly management techniques against the sucking pest complex of the chilli (*Capsicum annuum* L.), (cultivar - Konkan Kirti), a field experiment was carried out during the rabi season 2022-2023. Below are the experiment's specifics.

2.1 Cultural operations

The soil was prepared considering the needs of the chili crop in mind. Every last trace of the previous crop was eliminated. Randomized Block Design was used as the experimental platform (RBD). The complete dose of phosphorous and potash, together with half of the urea fertilizer, were applied at the time of seeding, and the remaining half of the urea fertilizer was applied 30 days later. Each plot in the experiment region received high-quality chilli (Cultivar: Konkan Kirti) seed. Forty days after seeding, the seedlings were transplanted. Weeding and other agronomic operations, such as intercultural activities, were carried out as recommended.

Table 1: Experimental details

Location	Vegetable Improvement Scheme, CES, Wakawali
Period of study	January 2023 to May 2023
Cultivar	Konkan Kirti
Spacing	60 cm x 60 cm
Size of treatment plot	3.6 m X 1.8 m
Total plot size	136.08 m^2
Date of transplanting	31/12/2022
Method of planting	On raised beds
Design	Randomized Block Design
Number of replications	Three
Number of Treatments	Seven

Table 2: Treatment Details

Tr. No.	Treatments	Conc. (%)	Dose
T_1	Undi oil	0.5	5 ml/lit
T_2	Soap Nut Extract	8	80 ml/lit
T_3	Neem Seed Kernel Extract	5	50 ml/lit
T_4	Neem Oil	0.5	5 ml/lit
T_5	*Beauveria bassiana* 2 x 10^8 cfu/g	0.4	4 ml/lit
T_6	*Lecanicillium lecanii* (2x10^8 cfu/g)	0.4	4 ml/lit
T_7	Untreated control	--	_

2.2 Spraying

Water was sprayed over three plots in the experimental field to determine the amount of spray suspension required for each treatment before biopesticides were applied. In the field, spray suspensions against thrips, aphids, and whiteflies were made at the necessary strength for each module. Three applications of the biopesticides were made. The first spray of each was applied as soon as the incident was observed, and the second and third sprays were administered with a manually powered knapsack sprayer at intervals of fifteen days. Five plants were chosen at random for each treatment, and the observations were noted for each plant.

2.3 Method of recording observations

Observation on the number of whiteflies, aphids and thrips was recorded on five randomly selected plants per plot. Number of pests was recorded from the three leaves top, middle and bottom of the plant. Pre-treatment observations were made on five randomly chosen plants one day before to the biopesticides being applied, and post-treatment observations were made on the second, third, and seventh day following each treatment in the early morning.

3. Results and Discussion

The data related to the efficacy of different eco-friendly management practices against sucking pests infesting chilli are given in Table III, IV and V.

3.1 To evaluate the efficacy of different eco-friendly management practices against whiteflies (*Bemisia tabaci*) infesting chilli

The data related to the efficacy of different biopesticides against whiteflies infesting chilli at 2^{nd}, 5^{th} and 7^{th} days after spray are presented in Table III and graphically represented in Fig.1

The data on mean population of whitefly per three leaves per plant after three sprays revealed that the treatment T_6 (*Lecanicillium lecanii* 2x10^8 cfu/ml @ 4 ml/lit) was the best treatment which recorded lowest mean population of whiteflies (1.54) per three leaves per plant and was at par with T_5 (*Beauveria bassiana* 2x10^8 cfu/ml @ 4ml/lit) which recorded (1.72) mean whitefly population. The next effective treatment was T_4 (Neem oil 0.5% EC @ 5ml/lit) with (1.99) and was at par with T_1 (Undi oil 0.5% EC @ 5ml/lit) with (2.06), followed by T_3 (NSKE 5% @ 50 ml/lit) with (2.48) and T_2 (Soap Nut Extract 8% @ 80ml/lit) with (2.54) mean whiteflies population per three leaves per plant. The greatest amount of whiteflies (3.27) per three leaves per plant was observed in the untreated control group, which was considerably inferior to all of the previous treatments.

The present findings are similar with the results of Harshita *et al*. (2019) [3] studied the management of whitefly, *B. tabaci* infesting tomato ecosystem and they reported that the treatment *B. bassiana* @ 5 ml/lit was noted 5.17 whitefly/ leaf followed by *B. thuringiensis* var. krustaki @ 2ml/lit (6.06 whitefly/ leaf), respectively. Javed *et al*. (2019) [4] tested two entomopathogenic fungi, *Beauveria bassiana* and *Verticillium lecanii* against whitefly and reported that the mortality caused by *B. bassiana* was maximum followed by *V. lecanii*. Chavan (2020) [1] evaluated the efficacy of different biopesticides on chilli and revealed that the treatment *Lecanicillium lecanii* 2×10^8 cfu/ml @ 4ml/lit was recorded lowest (1.49) mean whitefly population and treatment *Beauveria bassiana* 2×10^8 cfu/ml @ 5ml/lit recorded (1.55).

Table 3: Efficacy of different eco-friendly management practices against whitefly (*Bemisia tabaci*) infesting chilli

Treatment	Pre-count	Mean population of Whitefly per 3 leaves per plant									Overall Mean
		Ist spray			IInd spray			IIIrd spray			
		2 DAS	5 DAS	7 DAS	2 DAS	5 DAS	7 DAS	2 DAS	5 DAS	7 DAS	
T_1	2.93 (1.98)	2.73 (1.93)	2.63 (1.91)	2.53 (1.88)	2.23 (1.80)	1.87 (1.69)	1.80 (1.67)	1.60 (1.59)	1.33 (1.53)	0.93 (1.39)	2.06 (1.74)
T_2	2.90 (1.97)	2.87 (1.97)	2.83 (1.96)	2.80 (1.95)	2.73 (1.93)	2.53 (1.87)	2.53 (1.88)	2.27 (1.81)	2.00 (1.73)	1.93 (1.71)	2.54 (1.88)
T_3	2.97 (1.99)	2.80 (1.95)	2.73 (1.93)	2.70 (1.92)	2.67 (1.91)	2.47 (1.86)	2.50 (1.87)	2.20 (1.79)	1.93 (1.71)	1.87 (1.69)	2.48 (1.86)
T_4	2.93 (1.98)	2.63 (1.91)	2.60 (1.90)	2.50 (1.87)	2.17 (1.78)	1.83 (1.68)	1.73 (1.65)	1.40 (1.54)	1.27 (1.50)	0.87 (1.37)	1.99 (1.72)
T_5	2.87 (1.96)	2.53 (1.88)	2.47 (1.86)	2.37 (1.83)	1.87 (1.69)	1.47 (1.57)	1.27 (1.51)	0.97 (1.40)	0.80 (1.34)	0.53 (1.24)	1.72 (1.63)
T_6	2.92 (1.97)	2.50 (1.87)	2.30 (1.82)	2.13 (1.77)	1.63 (1.62)	1.27 (1.51)	1.07 (1.44)	0.67 (1.29)	0.53 (1.24)	0.33 (1.15)	1.54 (1.56)
T_7	2.97 (1.99)	3.20 (2.05)	3.27 (2.07)	3.33 (2.08)	3.47 (2.11)	3.53 (2.13)	3.60 (2.14)	3.27 (2.06)	3.13 (2.03)	2.93 (1.98)	3.27 (2.06)
S.E.M±	0.07	0.03	0.04	0.04	0.05	0.05	0.05	0.09	0.05	0.04	0.05
CD at 05%	NS	0.10	0.12	0.12	0.14	0.17	0.15	0.27	0.16	0.13	0.15

*Figures in parenthesis are $\sqrt{X+1}$ value
DAS - Days After Spraying

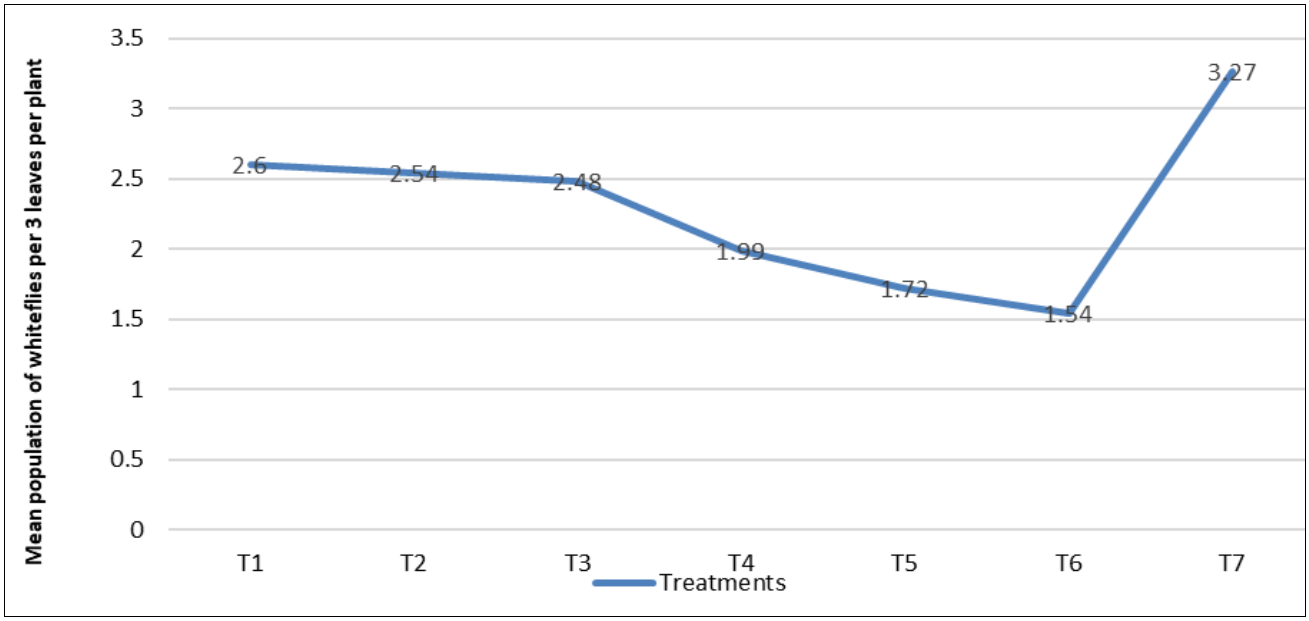

Fig 1: Overall efficacy of different eco-friendly management practices against whiteflies infesting chilli

3.2 To evaluate the efficacy of different eco-friendly management practices against thrips (*Scirtothrips dorsalis*) infesting chilli: The data related to the ef4icacy of different biopesticides against thrips infesting chilli at 2nd, 5th and 7th days after spray are presented in Table IV and graphically represented in Fig. 2

Table 4: Efficacy of different eco-friendly management practices against thrips (*Scirtothrips dorsalis*) infesting chilli

Treatment	Pre-count	Mean population of thrips per 3 leaves per plant									Overall Mean
		Ist spray			IInd spray			IIIrd spray			
		2 DAS	5 DAS	7 DAS	2 DAS	5 DAS	7 DAS	2 DAS	5 DAS	7 DAS	
T_1	4.23 *(2.29)	3.97 (2.23)	3.80 (2.19)	3.40 (2.10)	2.73 (1.93)	2.63 (1.90)	2.40 (1.84)	1.97 (1.72)	1.87 (1.69)	1.33 (1.53)	2.83 (1.94)
T_2	4.35 (2.31)	4.27 (2.29)	4.13 (2.27)	3.97 (2.23)	2.87 (1.97)	2.83 (1.96)	2.73 (1.93)	2.53 (1.88)	2.40 (1.84)	2.07 (1.75)	3.22 (2.04)
T_3	4.33 (2.31)	4.13 (2.26)	3.97 (2.23)	3.70 (2.16)	2.80 (1.95)	2.73 (1.93)	2.67 (1.91)	2.47 (1.86)	2.37 (1.83)	2.00 (1.73)	3.12 (2.01)
T_4	4.20 (2.28)	3.93 (2.22)	3.87 (2.20	3.33 (2.08)	2.67 (1.91)	2.53 (1.88)	2.33 (1.82)	1.87 (1.69)	1.70 (1.64)	1.20 (1.48)	2.70 (1.92)
T_5	4.23 (2.29)	3.70 (2.17)	3.53 (2.13)	2.97 (1.99)	2.23 (1.80)	1.80 (1.67)	1.53 (1.59)	0.97 (1.40)	0.67 (1.29)	0.37 (1.17)	2.20 (1.75)
T_6	4.30 (2.30)	3.87 (2.20)	3.70 (2.16)	3.00 (2.00)	2.40 (1.84)	2.27 (1.81)	1.80 (1.67)	1.37 (1.54)	1.00 (1.41)	0.67 (1.29)	2.44 (1.82

T_7	4.37 (2.32)	4.40 (2.32)	4.64 (2.38)	4.87 (2.42)	4.33 (2.31)	4.20 (2.28)	4.03 (2.24)	3.93 (2.22)	3.43 (2.11)	2.97 (1.99)	4.12 (2.26)
S.E.M±	0.14	0.11	0.07	0.04	0.03	0.05	0.04	0.04	0.03	0.04	0.05
CD at 05%	NS	0.32	0.21	0.13	0.10	0.14	0.12	0.12	0.10	0.12	0.15

*Figures in parenthesis are $\sqrt{X+1}$ value
DAS - Days After Spraying

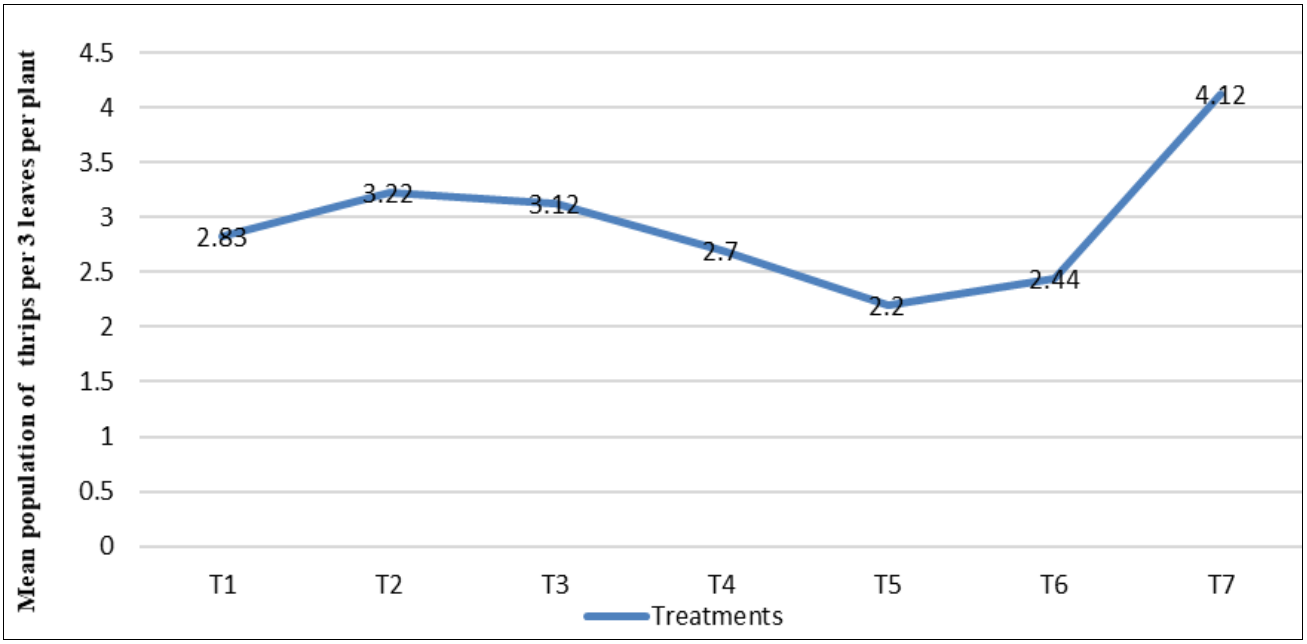

Fig 2: Overall efficacy of different eco-friendly management practices against thrips infesting chilli

The data related to the overall efficacy of different biopesticides against thrips per three leaves per plant infesting chilli after three sprays revealed that the T_5 (*Beauveria bassiana* $2x10^8$ cfu/ml @ 4ml/lit) was the most effective treatment which recorded (2.20) mean population of thrips per three leaves per plant and was at par with T_6 (*Lecanicillium lecanii* $2x10^8$ cfu/ml @ 4ml/lit) which recorded (2.44) thrips/ 3 leaves / plant. The T_4 (Neem oil 0.5% EC @ 5ml/lit) noticed (2.70) mean population of thrips followed by T_1 (Undi oil 0.5% EC @ 5ml/lit), T_3 (NSKE 5% @ 50ml/lit) and T_2 (Soap Nut Extract) with (2.83), (3.12) and (3.22) mean population of thrips per three leaves per plant. All the above treatments were found to be significantly superior over untreated control which recorded maximum thrips population (4.12) per three leaves per plant.

The current results are conformity with the findings of Hadiya *et al.* (2016) [2]. They evaluated the efficacy of different entomopathogenic fungus on chilli thrips and they reported that the treatment *Beauveria bassiana* @ 0.4% recorded lowest population of thrips (2.64/leaf) followed by treatment *V. lecanii* @ 0.4% (3.14/leaf), *M. anisopliae* @ 0.25% (3.96/leaf) and *N. riley* @ 0.1% (4.19), respectively. Kumar (2016) [5] studied the field efficacy of certain biopesticides against thrips (*S. dorsalis*) infesting chilli. He reported that the thrips population per cent reduction over control among the treatments, *B. bassiana* ($2x10^9$ spores/ml) 68.93%, *M. anisopliae* ($2x10^9$ spores/ml) 68.43%, *V. lecanii* ($2x10^9$ spores/ml) 63.25%, *N. riley* ($2x10^6$ spores/ml) 47.10 and *V. lecanii* ($2x10^6$ spores/ml) 50.83%, respectively. Chavan (2020) [1]. She studies the efficacy of different biopesticides against thrips on chilli and reported that the treatment *B. bassiana* $2x10^8$ cfu/ml @ 5ml/lit recorded the minimum mean population of thrips (1.87) per three leaves per plant followed by treatment *L. lecanii* $2x10^8$ cfu/ml @ 4ml/lit which noted (2.14) mean population of thrips.

3.3 To evaluate the efficacy of different eco-friendly management practices against aphids (*Aphis gossypii*) infesting chilli

The data related to the ef4icacy of different biopesticides against aphids infesting chilli at 2nd, 5th and 7th days after spray are presented in Table V and graphically represented in Fig.3

The data regarding overall mean of three sprays against aphids infesting chilli demonstrated that the T_6 (*Lecanicillium lecanii* $2x10^8$ cfu/ml @ 4ml/lit) was the best treatment which was recorded lowest (1.97) mean population of aphids per three leaves per plant and was at par with treatment T_5 (*Beauveria bassiana* $2x10^8$ cfu/ml @ 4ml/lit) which observed (2.05) aphids/ 3 leaves/ plant. The T_1 (Undi oil 0.5% EC @ 5ml/lit) recorded (3.96) mean population of aphids followed by T_4 (Neem oil 0.5% EC @ 5ml/lit) with (3.99) aphids per three leaves per plant. The T_2 (Soap Nut Extract 8% @ 80ml/lit) recorded (4.40) aphids mean population and was at par with T_3 (NSKE 5% @ 50ml/lit) with (4.41) aphids per three leaves per plant. All the above treatments were found superior over untreated control which recorded maximum aphid population (5.01) per three leaves per plant.

The present results are similar with the findings of Chavan (2020) [1]. She revealed that the treatment *Lecanicillium lecanii* $2x10^8$ cfu/ml @ 4ml/lit was found most effective against mean population of aphids (5.93). The next best treatment found was *Beauveria bassiana* $2x10^8$ cfu/ml @ 4ml/lit which recorded (6.18) mean population of aphids per three leaves per plant. Wade (2020) studied the efficacy of different pesticides against major insects of tomato and revealed that treatment *Verticillium lecanii* @ 5ml/lit was found to be the best treatment which recorded minimum (1.47) mean population of aphids per three leaves followed by treatment *Beauveria bassiana* @ 5 ml/lit which recorded (1.67) aphids per three leaves per plant.

Table 5: Efficacy of different eco-friendly management practices against aphids (*Aphis gossypii*) infesting chilli

Treatment	Pre- count	Mean population of Aphids per 3 leaves per plant									Overall Mean
		Ist spray			IInd spray			IIIrd spray			
		2 DAS	5 DAS	7 DAS	2 DAS	5 DAS	7 DAS	2 DAS	5 DAS	7 DAS	
T_1	6.27 *(2.65)	5.33 (2.51)	5.27 (2.49)	5.13 (2.48)	4.83 (2.41)	4.20 (2.28)	3.80 (2.18)	2.20 (1.79)	1.53 (1.59)	1.07 (1.44)	3.96 (2.18)
T_2	6.07 (2.66)	5.93 (2.63)	5.87 (2.62)	5.80 (2.61)	5.20 (2.49)	5.13 (2.48)	4.40 (2.32)	2.40 (1.84)	1.70 (1.64)	1.53 (1.59)	4.40 (2.29)
T_3	6.00 (2.65)	5.83 (2.61)	5.77 (2.60)	5.73 (2.59)	5.13 (2.48)	4.90 (2.43)	4.33 (2.31)	2.80 (1.95)	1.90 (1.70)	1.67 (1.63)	4.41 (2.30)
T_4	6.20 (2.68)	5.40 (2.53)	5.33 (2.52)	5.13 (2.48)	4.77 (2.40)	4.37 (2.32)	4.00 (2.24)	2.27 (1.81)	1.47 (1.56)	0.93 (1.39)	3.99 (2.19)
T_5	6.07 (2.65)	5.13 (2.48)	5.00 (2.45)	4.90 (2.43)	4.20 (2.28)	3.93 (2.22)	3.00 (2.00)	1.13 (1.46)	0.97 (1.40)	0.27 (1.12)	3.46 (2.05)
T_6	6.23 (2.69)	4.87 (2.42)	4.60 (2.37)	4.47 (2.34)	3.93 (2.22)	3.27 (2.06)	2.47 (1.86)	0.93 (1.39)	0.67 (1.29)	0.13 (1.06)	3.16 (1.97)
T_7	6.27 (2.69)	6.20 (2.68)	6.33 (2.71)	6.13 (2.67)	5.27 (2.50)	5.17 (2.48)	4.53 (2.35)	3.60 (2.14)	3.47 (2.11)	3.00 (2.00)	5.01 (2.43)
S.E.M±	0.15	0.04	0.06	0.04	0.03	0.04	0.07	0.04	0.05	0.05	0.05
CD at 05%	NS	0.13	0.20	0.12	0.09	0.13	0.22	0.14	0.15	0.15	0.15

*Figures in parenthesis are $\sqrt{X+1}$ value
DAS - Days After Spraying

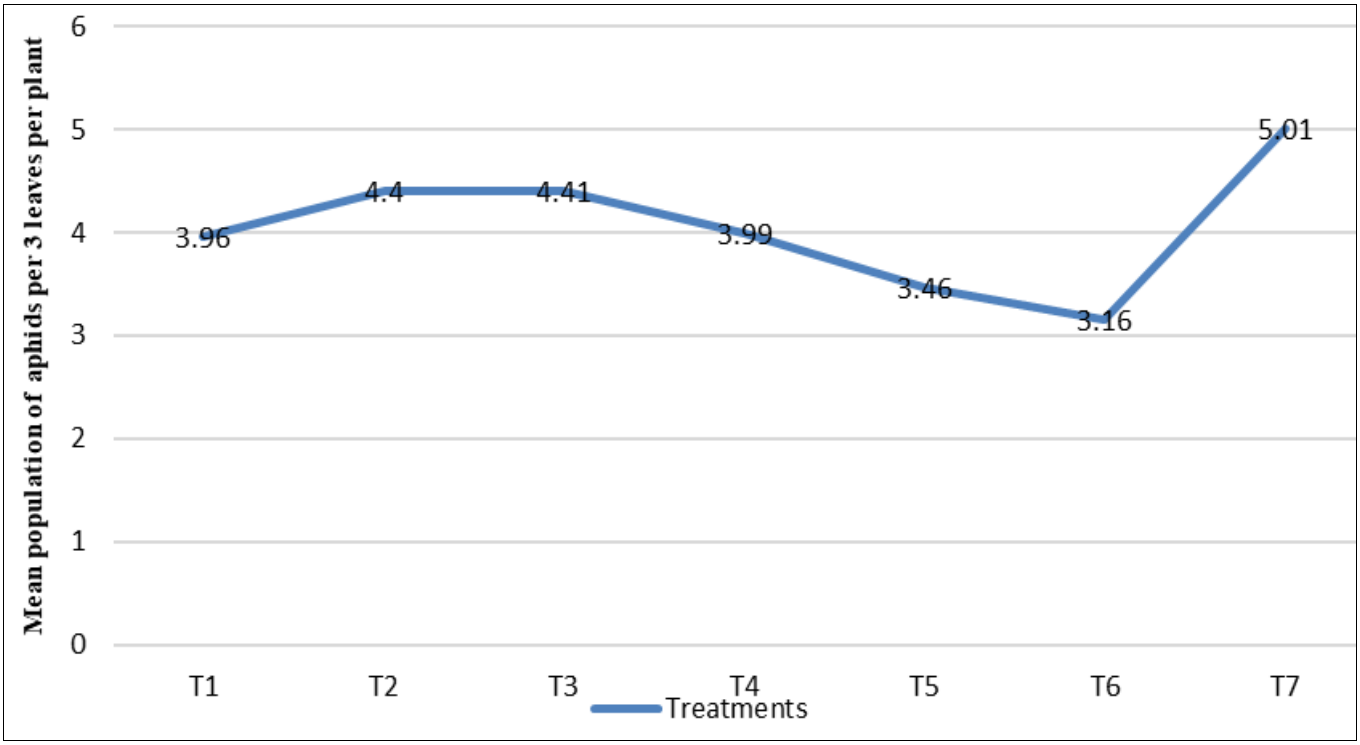

Fig 3: Overall efficacy of different eco-friendly management practices against aphids infesting chilli

4. Conclusion

From the present study, it can be concluded the most effective treatment for effectively managing whiteflies infesting chilli was found to be *Verticillium lecanii* 2x10^8 cfu/ml @ 4ml/lit, with a minimal (1.54) mean population of whiteflies per three leaves per plant. *Beauveria bassiana* 2x10^8 cfu/ml @ 4ml/lit revealed to be an effective treatment for chilli thrips, leading to the lowest mean population of thrips per three leaves per plant (2.20). On the other hand, *Verticillium lecanii* 2x10^8 cfu/ml @ 4ml/lit proved to be the most efficient treatment to deal with the aphid infestation in chilli, as indicated by the lowest mean population of aphids (1.97) per three leaves per plant. Thus, adopting such environmentally friendly management techniques assists farmers in decreasing the use of dangerous chemical pesticides, which lowers crop costs and boosts production.

5. Acknowledgement

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6. References

1. Chavan A. Screening of genotypes, seasonal incidence and bio intensive management of pests infesting chilli (*Capsicum annuum* L.), [Master's Thesis]. Dapoli: Dr. BSKKV; c2020.
2. Hadiya G, Kalairiya G, Kalola N. Efficacy of different entomopathogenic fungus on chilli thrips. Adv Life Sci. 2016;5(5):1658-1660.
3. Harshita AP, Saikia DK, Devee A. Population dynamics

and management of whitefly, *Bemisia tabaci* in tomato ecosystem, *Solanum lycopersicum* L. J Entomol Zool Stud. 2019;7(2):1232-1235.
4. Javed K, Javed H, Mukhtar T, Qui D. Efficacy of *Beauveria bassiana* and *Verticillium lecanii* for the management of whitefly and aphids. Pak J Agri Sci. 2019;56(3):669-674.
5. Kumar M. Studies on isolation and characterization of entomopathogenic fungi and their effectiveness against insect pests [Doctoral Dissertation]. Meerut: Sardar Vallabhbhai Patel University of Agriculture and Technology; 2016.
6. Kumar NKK. Yield loss in chilli and sweet pepper due to *Scirtothrips dorsalis* Hood. (*Thysanoptera: Thripidae*). Pest Manag Hort Ecosyst. 1995;1:61-9.
7. Nelson SJ, Natarajan S. Economic threshold level of thrips in Semi-dry chilli. South Indian Hortic. 1994;42:336-8.
8. Wade PS, Wankhede SM, Rahate SS. Efficacy of different pesticides against major pests infesting tomato (*Solanum lycopersicum* L.). J Pharmacogn Phytochem. 2020;9(4):545-548.
9. Yadav S, Kumar L, Jakhar A, Kumar H, Jat MK, Kapoor P, Kumar V. Population dynamics of major sucking insect pests on chilli (*Capsicum annum* L.). J Agric Ecol. 2022;13:79-9.

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