BIOEFFICACY REPORT

Evaluation of a Botanical Pesticide - Dr Sure Against Thrips in Nagpur Mandarin

Tested Product: Dr Sure

Krishna Valley Agrotech LLP

Submitted By:

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Objectives of the Study

The present study was undertaken to systematically evaluate the bio efficacy of the botanical pesticide Dr Sure against thrips infestation in citrus (Nagpur Mandarin) under field conditions by monitoring changes in pest population at defined intervals after application. In addition, the study aimed to assess the crop safety (phytotoxicity) of Dr Sure at the recommended dose by observing any adverse effects such as leaf burn, chlorosis, necrosis, wilting, or growth suppression on treated plants. The investigation also focused on understanding the population dynamics of thrips in response to sequential applications of the product, particularly the extent and duration of pest suppression across multiple observation periods. Further, the study sought to determine the effectiveness of repeated applications (two sprays at a 15-day interval) in achieving sustained control of thrips during the critical flowering stage (Ambiya Bahar). Ultimately, the objective was to generate reliable field-level performance data to support the use of Dr Sure as a botanical alternative within integrated pest management (IPM) strategies and residue-free citrus production systems.

Trial Details

The field trial was conducted at Nagpur, Maharashtra, India, a prominent citrus-growing region known for the cultivation of Nagpur Mandarin. The study was carried out during March 2025, coinciding with the Ambiya Bahar (spring blossom) season, which is a critical growth stage for citrus and highly susceptible to thrips infestation.

The experimental crop selected for the study was Orange (Nagpur Mandarin), a commercially important variety widely cultivated in the region. The trial was implemented under real farm conditions at the field of Adv. Rajendra Kadu, ensuring practical applicability and relevance of the results.

The total experimental area covered under the study was 3 different plots of 0.5 acre, where standard agronomic practices were followed throughout the crop period, except for the plant protection treatments under evaluation.

Trial Conducted By

The field trial was conducted and supervised by experienced technical professionals to ensure scientific accuracy and reliability of the observations.

- **Mr. Omkar Sawant, Chief Techno Commercial Manager** – Oversaw trial execution, coordination, and overall study design, ensuring adherence to field protocols and practical applicability.
- **Mr. Neeraj Jatkar**, **Entomologist** – Responsible for pest monitoring, data recording, and technical evaluation of thrips population dynamics.

Test Product Details

The test product evaluated in the present study was **Dr Sure**, a botanical pesticide formulated for the management of sucking pests in agricultural crops. Being of botanical origin, the product is designed to offer an eco-friendly and residue-free alternative to conventional chemical pesticides, making it suitable for use in sustainable and integrated pest management (IPM) programs.

Dr Sure is available in **liquid formulation**, which ensures ease of handling, uniform mixing, and efficient application under field conditions. The product was applied at a recommended dose of **2 ml per litre of water**, ensuring adequate coverage of the plant canopy for effective pest control.

The method of application adopted for the study was **foliar spray**, which is commonly practiced for managing thrips infestation in citrus. Care was taken to achieve uniform spray coverage, particularly on flowers and tender plant parts, where thrips incidence is typically higher.

A total of **two sprays** were carried out during the trial period, with an interval of 15 days between applications. This spray schedule was designed to evaluate both the immediate impact of the product on the pest population as well as its residual effectiveness over time.

Experimental Design

The field experiment was conducted using a comparative study design, wherein the performance of the treated plot (application of Dr Sure) was evaluated against an untreated control plot under similar agronomic conditions. This approach enabled a direct assessment of the product's efficacy in reducing thrips population under practical field conditions.

The total experimental area was divided into two equal plots of 0.5 acre each, representing the treated and control sections, respectively. Both plots were maintained uniformly with respect to crop management practices, except for the application of the test product in the treated plot.

The trial was conducted with three replications, reflecting real farm conditions and ensuring that the observations were representative of practical field performance. The crop was maintained at standard spacing as per recommended agronomic practices for Nagpur Mandarin, ensuring optimal plant growth and uniformity across the experimental area.

No standard chemical check was included in the study, as the primary objective was to evaluate the standalone performance of the botanical pesticide under field conditions. This design allowed for a clear comparison between treated and untreated plots, highlighting the direct impact of the test product on thrips population.

Observations:

The observations on thrips population (number per leaf) were recorded at different intervals, namely pre-treatment, 1, 3, and 10 days after spray (DAS), for both treated (Amrut Dr Sure) and untreated control plots.

The data clearly indicate a progressive decline in thrips population in the treated plots following each application of Dr Sure. After the first spray, a gradual reduction in pest population was observed from pre-count to 10 DAS, indicating the initial effectiveness of the product. However, a more pronounced reduction was recorded after the second spray, demonstrating the cumulative and sustained effect of repeated application.

In contrast, the control plots exhibited a consistent increase in thrips population across all observation intervals, which is typical under favourable environmental conditions during the flowering stage (Ambiya Bahar). This increasing trend in untreated plots highlights the natural pest buildup in the absence of any control measures.

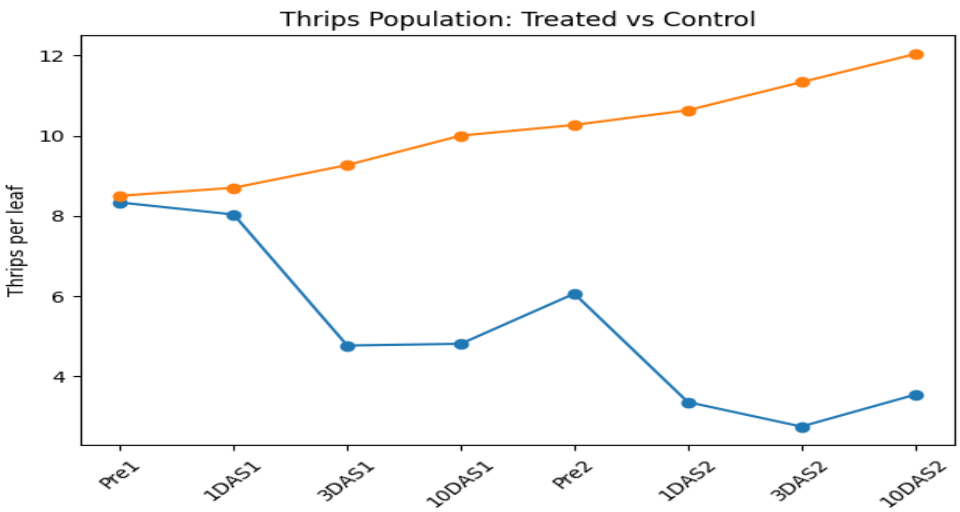
The comparative analysis between treated and control plots clearly establishes that Dr Sure effectively suppresses thrips population, with maximum reduction observed at 3 DAS after the second spray. The results also indicate that sequential applications are necessary to achieve sustained pest control during critical crop stages.

Location	Treatment Details	No of Thrips/ leaf (Crop: Citrus)							
		First spray				Second Spray (15 days later)			
		Pre Count	1 DAS	3 DAS	10 DAS	Pre Count	1 DAS	3 DAS	10 DAS
Plot -1	Amrut Dr Sure	9.33	8.90	6.00	5.33	6.33	4.67	2.19	3.87
	Control	9.50	9.70	10.20	11.00	11.20	11.50	12.30	13.10
Plot-2	Amrut Dr Sure	7.00	6.95	3.20	3.85	5.63	2.10	3.15	3.60
	Control	7.20	7.35	7.90	8.60	8.90	9.20	9.85	10.40
Plot -3	Amrut Dr Sure	8.67	8.25	5.10	5.25	6.22	3.30	2.90	3.15
	Control	7.8	9.05	9.7	10.4	11.1	11.2	11.85	12.6

Table 1: Observation data of average Thrips per leaf / flower; (DAS = Days after Spray)
Note: Average thrips per leaf on 10 leaves per plant and 10 plants per location.

Observation	Treated Mean	Control Mean
Pre (1st Spray)	8.33	8.5
1 DAS	8.03	8.7
3 DAS	4.77	9.27
10 DAS	4.81	10
Pre (2nd Spray)	6.06	10.27
1 DAS	3.36	10.63
3 DAS	2.75	11.33
10 DAS	3.54	12.03

Table 2: Mean Thrips population; (DAS = Days after Spray)



Observation	% Reduction
Pre (1st Spray)	2.00%
1 DAS	7.70%
3 DASa	48.50%
10 DAS	51.90%
Pre (2nd Spray)	41.00%
1 DAS	68.40%
3 DAS	75.70%
10 DAS	70.60%

Table 3: % Reduction Over Control (Abbott's Formula);
(DAS = Days after Spray)

Phytotoxicity Observations

The treated crop was carefully monitored for any signs of phytotoxic effects following the application of Dr Sure at the recommended dose of 2 ml per litre of water. Observations were recorded at regular intervals after each spray to assess the safety of the product on the crop.

No phytotoxic symptoms such as leaf burn, chlorosis (yellowing), necrosis, wilting, epinasty, or stunting were observed on the treated plants throughout the duration of the trial. The foliage remained healthy, with normal growth and development comparable to or better than the untreated control.

Furthermore, no adverse effects on flowering or overall plant vigor were recorded, indicating that the product is safe for application during critical crop stages such as Ambiya Bahar.

Based on these observations, it can be concluded that Dr Sure is **non-phytotoxic and safe for use on Nagpur Mandarin citrus at the recommended dose under field conditions**.

Sr. No.	Parameter Observed	Rating Scale (0–10)*	Observation
1	Leaf Injury / Burn	0	Not observed
2	Chlorosis (Yellowing)	0	Not observed
3	Necrosis	0	Not observed
4	Wilting	0	Not observed
5	Epinasty (Leaf Curling)	0	Not observed
6	Hyponasty	0	Not observed
7	Stunting / Growth Inhibition	0	Not observed
8	Effect on Flowering	0	No adverse effect
9	Overall Crop Vigor	0	Normal / Healthy

Rating Scale Explanation

- 0 = No phytotoxicity (completely safe)
- 1–3 = Slight
- 4–6 = Moderate
- 7–9 = Severe
- 10 = Complete damage

Conclusion

Dr Sure demonstrated significant and consistent suppression of thrips population compared to untreated control, with enhanced efficacy observed after sequential applications, indicating its suitability as an effective botanical tool for thrips management in citrus under field conditions.

Farmer Mr Rajendra Kadu with Dr Sure bottle

Mr Neeraj Jatkar conducting sprays at field

Mr Neeraj Jatkar taking observations at different stages

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