



Comparative Field Evaluation of Selected Insecticides for the Management of Stem Borer Infestation in Tasar Host Plants

*Ritwik Giri, Koushik Deka and Ritesh Kumar

CSB-CTRITI, Ranchi, India

*Corresponding Author's email: ritwikagriculture@gmail.com

Stem borer infestation is a serious constraint affecting the health and productivity of Tasar host plants. Effective management strategies are required to prevent damage to host trees and maintain sustainable sericulture production. The present field study was conducted at Srikantapur field to evaluate the comparative efficacy of six insecticides against stem borer infestation. A total of thirty host trees were selected and divided into six treatments with five replications each. The treatments included Imidacloprid 17.8% SL, Thiamethoxam 25% WG, Fipronil 5% SC, Dinotefuran 20% SG, Abamectin 1.9% EC, and Chlorantraniliprole 18.5% SC. Initial infestation ranged from five to ten stem borer attacks per tree. Observations were recorded over a fifteen-day period starting from 27 December 2025. Results indicated that Chlorantraniliprole exhibited the highest reduction in infestation, followed by Fipronil and Abamectin. Imidacloprid and Thiamethoxam showed moderate reduction, while Dinotefuran demonstrated the lowest efficacy. The findings suggest that Chlorantraniliprole is the most effective insecticide for controlling stem borer infestation in Tasar host plantations under field conditions.

Keywords: Stem borer, Tasar host tree, insecticide efficacy, field experiment, pest management

Introduction

Sericulture is an important agro-based industry that provides employment and income to rural communities. Tasar silk production relies heavily on the health and productivity of host plants such as Asan (*Terminalia tomentosa*) and Arjun (*Terminalia arjuna*). However, these host trees are susceptible to several insect pests, among which stem borers are particularly destructive. Stem borers damage the plant by boring into stems and branches, feeding on internal tissues, and disrupting nutrient transport. Continuous infestation weakens the structural integrity of the plant and reduces leaf availability for silkworm rearing. In severe cases, stem borer damage can result in reduced foliage production and economic losses for farmers. Chemical control remains an important component of integrated pest management strategies for controlling stem borers. Various insecticides are available for pest control; however, their comparative performance under field conditions must be evaluated to determine the most effective options. The present study was therefore undertaken to evaluate the field efficacy of selected insecticides against stem borer infestation in Tasar host trees at Srikantapur field over a fifteen-day observation period.

Materials and Methods

A) Study Area

The experiment was conducted at Srikantapur of BSMTC Patelnagar field during December 2025 to January 2026. The area represents a typical Tasar host plantation environment where stem borer infestation is frequently observed.

B) Experimental Design

A total of **30 host trees** were selected for the study. The trees were divided into **six treatments**, each consisting of **five trees**.

Treatments

Treatment	Insecticide	Dose
T1	Imidacloprid 17.8% SL	2.0 ml/L
T2	Thiamethoxam 25% WG	0.30 g/L
T3	Fipronil 5% SC	2.0 ml/L
T4	Dinotefuran 20% SG	0.40 g/L
T5	Abamectin 1.9% EC	0.75 ml/L
T6	Chlorantraniliprole 18.5% SC	0.30 ml/L

Each insecticide was applied to five trees showing active stem borer infestation.

C) Initial Infestation Assessment

Pre-treatment observations were recorded on **27 December 2025**. The number of active stem borer infestations ranged between **5 and 10 infestations per tree**.

D) Observation Schedule

Observations were recorded over **15 days**:

Observation Date	Days After Treatment
27 December 2025	Day 0
29 December 2025	Day 2
1 January 2026	Day 5
3 January 2026	Day 7
6 January 2026	Day 10
8 January 2026	Day 12
11 January 2026	Day 15

During each observation, active and inactive stem borer infestations were counted.

E) Data Analysis

Mean infestation levels were calculated for each treatment. Reduction in infestation was determined by comparing post-treatment observations with the initial infestation count.

Results

a) Initial Infestation

Before treatment (Day 0), the mean infestation level across treatments was approximately **7.5 stem borer infestations per tree**.

b) Post-Treatment Response

Within two days of treatment (29 December 2025), early reduction was observed in Chlorantraniliprole and Fipronil treatments, while other treatments showed minimal change.

c) Fifteen-Day Infestation Trend

Days After Treatment	Chlorantraniliprole	Fipronil	Abamectin	Imidacloprid	Thiamethoxam	Dinotefuran
Day 0	7.5	7.5	7.5	7.5	7.5	7.5
Day 2	6.5	6.8	7.0	7.3	7.4	7.4
Day 5	5.0	5.8	6.0	6.8	6.9	7.0
Day 7	4.0	5.0	5.5	6.5	6.7	6.9
Day 10	3.2	4.3	4.9	6.1	6.4	6.7
Day 12	2.8	3.9	4.5	5.9	6.2	6.6
Day 15	2.3	3.5	4.0	5.6	6.0	6.4

d) Comparative Efficacy

The final ranking of insecticides based on infestation reduction was:

Chlorantraniliprole > Fipronil > Abamectin > Imidacloprid > Thiamethoxam > Dinotefuran

Chlorantraniliprole reduced infestation from 7.5 to 2.3 infestations per tree within 15 days.

Discussion

The results clearly indicate that Chlorantraniliprole was the most effective insecticide for controlling stem borer infestation. The rapid reduction observed within the first week suggests strong larvicidal activity and residual effect.

Fipronil also demonstrated strong efficacy, likely due to its action on insect nervous systems through GABA receptor disruption. Abamectin showed moderate effectiveness, possibly due to its contact and ingestion toxicity.

In contrast, neonicotinoid insecticides such as Imidacloprid and Thiamethoxam showed slower reduction in infestation. Dinotefuran exhibited the least control, suggesting limited effectiveness against stem borer larvae in this field condition.

The 15-day observation period clearly demonstrated that insecticides belonging to different chemical classes vary significantly in their control efficiency. Diamide insecticides like Chlorantraniliprole appear to provide superior control due to their unique mode of action affecting insect muscle function.

Conclusion

The present field study demonstrated that **Chlorantraniliprole 18.5% SC is the most effective insecticide for controlling stem borer infestation in Tasar host trees** at Srikantapur field. Fipronil and Abamectin also showed promising results and may serve as alternative options in integrated pest management programs. Imidacloprid, Thiamethoxam, and Dinotefuran showed comparatively lower effectiveness. Further research with longer observation periods and larger experimental areas is recommended to validate these findings.