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Field Evaluation of Insecticides Against Major Pests of Soybean

Kommana Sai Sirisha
M.Sc. (Ag.) Agricultural Entomology, Dr. PDKV, Akola

**Corresponding author: skkommana98@gmail.com*

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INTRODUCTION

Soybean, popularly known as the "Golden Bean," is a major oilseed crop of India. It plays a vital role in Indian agriculture due to its rich protein (40%) and oil (20%) content. However, soybean cultivation is significantly affected by several insect pests, leading to heavy yield losses if not properly managed. Some of the major pests include stem fly (Melanagromyza sojae), girdle beetle (Obereopsis brevis), green semilooper (Chrysodeixis acuta), and Spodoptera litura.

This article summarizes a field study conducted during Kharif 2021 at Dr. Panjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, to evaluate the effectiveness of various insecticides against major soybean pests under real field conditions.

Objective of the Study

- To evaluate the bioefficacy of selected insecticides against major soybean pests.
- To assess the impact on natural enemies.
- To determine economic viability through yield and cost-benefit analysis.

Pests Covered

- Stem Fly (Melanagromyza sojae): Causes tunneling and drying of shoots.
- Girdle Beetle (Obereopsis brevis): Bores into stems causing breakage.
- Defoliators: Green semilooper and Spodoptera litura cause leaf loss, reducing photosynthesis and overall yield.

Treatments and Insecticides Used

Treatment No.	Insecticide	Dose (ml/litre)
T1	Chlorantraniliprole 18.5% SC	3.0
T2	Emamectin benzoate 1.9% EC	8.5
T3	Thiamethoxam 12.6% + Lambda-cyhalothrin 9.5% ZC	2.5

T4	Indoxacarb 15.8% EC	6.6
T5	Imidacloprid 48% FS	2.5
T6	Flubendiamide 39.35% SC	3.0
T7	Untreated control	—

Key Results

- Stem Fly Control: Chlorantraniliprole, Thiamethoxam + Lambda-cyhalothrin, and Indoxacarb performed significantly better.
- Girdle Beetle: Chlorantraniliprole showed superior control.
- Defoliators: Chlorantraniliprole, Flubendiamide, and Indoxacarb recorded lower larval populations.

All insecticidal treatments were found safe for beneficial insects like ladybird beetles and spiders.

Yield and Economic Returns

- Highest grain yield: Chlorantraniliprole (18.80 q/ha)
- Followed by: Flubendiamide (18.02 q/ha), Thiamethoxam + Lambda-cyhalothrin (17.12 q/ha)
- Best Cost-Benefit Ratio (ICBR): Thiamethoxam + Lambda-cyhalothrin (1:11.26)

Conclusion and Farmer Recommendations

- Chlorantraniliprole is highly effective and improves yield.
- Thiamethoxam + Lambda-cyhalothrin offers excellent pest control and economic return.
- Timely spray at 37 and 51 DAS is essential.
- All tested insecticides are safe for natural enemies and fit in IPM strategies.

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