

# Control of Fall Armyworm (*Spodoptera frugiperda*) by Using Some Selective Chemical Insecticides

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**Abstract:-** In India Fall Armyworm (*Spodoptera frugiperda*) is Serious major insect pest on Maize . Fall Armyworm comes in India in 2018 . The pest infestation & has been reported from maize farms in 20 states Present investigation carried out to determine efficiency of Thiomethoxam 25%WG & Lambdacyhalothrin 5% SC against attack of FAW & Observations recorded such infected Plants.

1. Thiomethoxam is systemic insecticide in class of neonicotinoids. It has broad spectrum activity against many types of insects.
2. Lambdacyhalothrin is pyrethroid insecticide & acaricide used to control wide range of pest.

**Keywords:-** Thiomethoxam , Lambdacyhalothrin , Fall Armyworm , Maize.

## I. INTRODUCTION

The fall armyworm (*Spodoptera frugiperda*) is a species in the order and is the life stage of a fall armyworm . The term "armyworm" can refer to several species, often describing the large-scale invasive behavior of the species' larval stage. It is regarded as a and can damage and destroy a wide variety of , which causes large economic damage. Its scientific name derives from *frugiperda*, which is from *frui* (fruit) and *perda* (loss), named because of the species' ability to destroy crops. Because of its propensity for destruction, the fall armyworm's habits and possibilities for crop protection have been studied in depth. It is also a notable case for studying , as it appears to be diverging into two species currently. Another remarkable trait of the larva is that they practice . The fall armyworm is active at a different time of year from the , another species in the order and family , but of the genus . Outbreaks of the true armyworm usually occur during the early part of the summer; the fall armyworm does most damage in the late summer in the southern part of the United States, and early fall in the northern regions. Life History The fall armyworm's life cycle is completed within 30 days during summer, and 60 days during the spring and autumn seasons; during the winter, these caterpillars' life cycle lasts about 80 to 90 days. The number of generations a moth will have in a year varies based on climate, but in her life span a female will typically lay about 1,500 eggs. Because larva cannot enter into diapause they cannot survive cold temperatures.

### ➤ Egg

The armyworm's egg is dome-shaped, and measures around 0.4 mm in diameter and 0.3 mm in height. Females prefer to lay eggs on the underside of leaves, but in high populations they will lay them just about anywhere. In warm weather, the eggs will hatch into larvae within a few days.

### ➤ Larva

The larva go through six different , each varying slightly in physical appearance and pattern. The larva process lasts from 14 to 30 days, again depending on temperatures. The mature caterpillar is about 1.5–2.0 inches (38–51 mm) in length. This is the most destructive life stage as the larvae have biting mouth parts. The larvae have a distinctive inverted Y suture on the forehead.

### ➤ Pupa

The larva then underground for 7 to 37 days in a cocoon they form of soil and silk. Duration and survival of the pupal stage depend on the temperature of the environment.

### ➤ Adults

Once emerged, the adults live for about 10 days, and sometimes up to 21 days, with the female laying most of her eggs early in life. Adults are nocturnal and fare best during warm and humid nights.

### ➤ Migration

Adults are capable of flying long distances, so even though they are unable to north of the southern region of the United States, the moths can migrate as far north as Southern Canada in warm months. Their rate is remarkably fast, estimated at 300 miles per generation. Some scientists speculate that this fast migration is aided by the movement of air in weather fronts armyworm larvae can wreak havoc on a wide range of crops. The first historical account of the fall armyworm's destruction was in 1797 in Georgia. Destruction can happen almost overnight, because the first stages of a caterpillar's life require very little food, and the later stages require about 50 times more. Because of this rapid change in food consumption, the presence of larva will not be noticed until they have destroyed almost everything in as little as a night. Some examples of targeted crops include cotton, tobacco, sweet corn, rice, peanuts, and even fruits such as apples, oranges, and many more. The list of possible food sources for the worms is extensive, so crop damage is wide-ranging. It is estimated that almost 40 percent of those species that armyworms target are

economically important. Because the larva eat so much of the plant, they are very detrimental to crop survival and yield. In corn, larvae will even burrow into the corn ear to eat the kernels. For the control of fallarmyworm many insecticides suggested by agricultural department. Some were costly

Some were cheap. Among the we carried out efficiency test of two insecticides which are broad spectrum in nature and from different groups viz. Thiomethoxam 25% WG and Lambdacyhalothrin 5% SC was sprayed spread in maize field at 15 DAS when infestation started in the field 2 infested plants found at 1M2. The experiment conducted on maize field at Bhilwadi, Sangli Total area was Two acres.

## II. MATERIALS AND METHODS

As FAW serious pest of maize for studying the efficacy of these two chemicals which are broad spectrum in nature viz. Thiomethoxam 25% WG and

Lambdacyhalothrin 5% SC used and observations recorded. Spraying conducted using knapsack sprayer of capacity 200lit. for preparing the solution first pump cleaned with water and soap solution. After half pump filled with water and another small container Thiomethoxam and Lambdacyhalothrin solution mixed well. And transferred into knapsack sprayer and final volume made upto 200lit. spraying carried out at evening 5PM leaves were wetted totally with fine mist of spray solution and some spraying solution allowed to go inside the panicle as larvae feeds on growing leaves and panicle. The chemicals were selected one is pyrethroid and one is organophosphate both have different mode of action. modulator which shows quick knockdown effect stomach poison and contact poison. Experiment conducted on field at Village-Bhilwadi, Dist-Sangli Maharashtra.

Following two insecticides were used as shown in table no. 1.

Table 1

Sr. no.	Insecticide	Active Ingredient (AI)	Concentration Used For Spraying
1.	Thiomethoxam	Thiomethoxam 25% WG	For 2 acres 200 lit- 100gm
2.	Lemsik	Lambdacyhalothrin 5% SC	For 2 acres 200 lit- 200ml

## III. RESULT AND DISCUSSION

In the experiment used two chemicals which is pyrethroids both chemicals are broad spectrum in nature used to management of many pests. Both chemicals having strong odour. Both having different mode of action one having quick knock down action one is contact poison with AchE inhibitors which kills larvae or mouth which comes in contact. The spraying started at evening time. The insecticides used as shown in table no 1. While recording observation we did count of infected plants with FAW and after 3 to 4 days and time required to death of larvae. While counting we found only 8 infected plants by calculating DAS average infestation of all rows. Up to 20 DAS and we conducted second spraying at 22 th day upto 45 DAS no new infestation recorded in this field. As crop gets heighted damage get reduced from 45DAS. After spraying within two minutes 2 and 3 instar larvae were collected which showing paralysed symptom after 10 minutes death of larvae occur. Observation taken a row of 100 plant selected and affected plants calculated we found only 2 to 3 damaged on 27 As we used chemical these are on an average the damage recorded on average basis only 2 to 3%.

### ➤ Thiomethoxam 25% WG

- Thiomethoxam is broad spectrum, systemic insecticide which means it is absorbed quickly by plants & transported to all of its parts.
- More resistant to washing off due to rain water.
- Relatively cost effective.
- It has greater effectiveness against all lepidopteran pests.

- Thiomethoxam is approved for use in the US as an antimicrobial pesticide wood preservative & as a pesticides.

### ➤ Lambdacyhalothrin 5% SC

- Pyrethroids such as Lambdacyhalothrin are often preferred as an active ingredients in agricultural insecticides because they are more cost effective & longer acting.
- Lambdacyhalothrin are now used to control insects & spider mites in crops including cotton, maize, cereals, potatoes & vegetables.
- Lambdacyhalothrin disrupt the functioning of the nervous system in an insect pest.

## IV. CONCLUSION

Spraying of both chemical simultaneously showing good effect in average cost for management of FAW. Spraying of Thiomethoxam 25% WG and Lambdacyhalothrin 5% SC as per concentration given in table no-1. FAW management can be done effectively. While spraying carried out first spray at 10DAS and second spray at 20 DAS. Gives effective management against FAW can be recommended to farmers in this region.

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