

Student notes/Essays/Poems

Fall armyworm: A destructive pest of maize

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Introduction

Spodoptera frugiperda (Smith), fall armyworm is a lepidopteran belonging to Noctuidae family. The fall armyworm is native to the tropical regions of the western hemisphere from the United States to Argentina. In 2016 it was reported for the first time in West and Central Africa, but now it threatens Africa and Europe. The term armyworm can refer to several species often describing the large-scale invasive behavior of the species. Larval stage '*frugiperda*' Latin for lost fruit, named because of the species ability to destroy crops.

Life cycle of fall armyworm:

It includes egg, 6 growth stages of caterpillar, pupa and moth.

Day 1-3: The cycle begins when 100 to 200 eggs are laid on the underside of the leaves, typically near the base of the plant, close to junction of the leaf and stem.

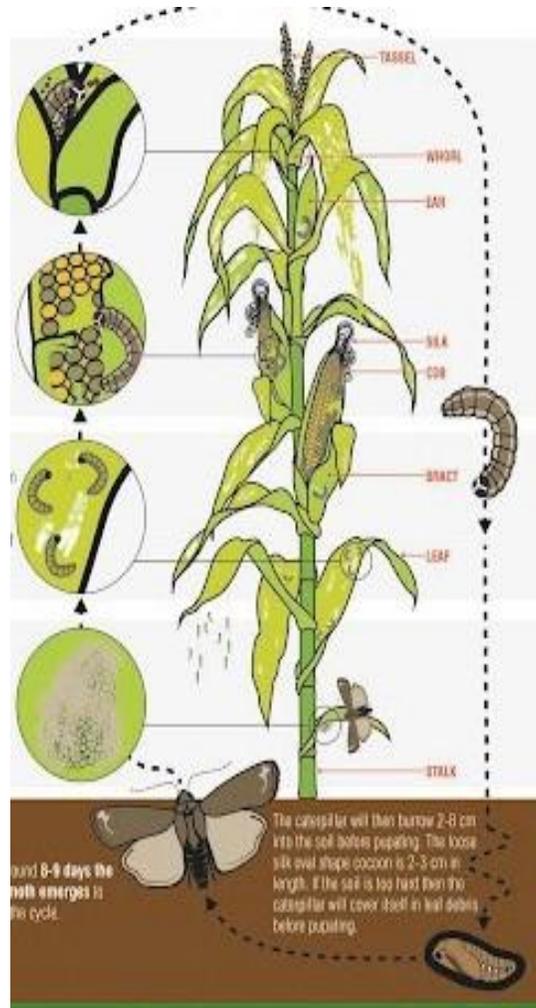
Day 3-6: After hatching the young one feed on leaves leaving semi transparent patches called

windows. In young plants, the caterpillars prefer to eat the leaf whorl, but in older prefer leaves around the cob silks.

Day 6-14: Caterpillars will also eat their way through the protective leaf bracts into the side of the cob where they feed on developing kernels. By the time the caterpillars reach the top of the plant. They will be bigger and do the most damage, leaving ragged holes in the leaves. On young plants, this can kill the growing point, stopping new leaves or cobs from developing.

Day 14 -23: After approximately 14 days, fully grown caterpillars will drop to the ground and pupate. Before pupating the caterpillars burrow 2-8 cm into the soil. Around 8th day adult moth will emerge from the ground and the cycle will start all over again.

The life cycle is completed in about 30 days during the summer, but 60 days in the spring and autumn, and 80 to 90 days during the winter.



A picture from FAO (2018), IPM of fall armyworm

On Maize ;A guide for farmer field schools in Africa.



Early stages of development of Fall armyworm

Source; Photograph by James Castner, University of Florida..

Identification

The egg is dome shaped; the base is flattened and the egg curves upward to a broadly rounded point at the apex

Larvae: There usually are six instars in fall armyworm. However, this larva does not feel rough to the touch, as does corn earworm, *Helicoverpa zea* because it lacks the microspines found on the similar-appearing corn earworm. Fall armyworm resembles both armyworm and corn earworm



Male



Female

(Photo by J.E. Smith)

Two distinct features identify fall armyworms. The head has light markings that form an upside down “Y” while the opposite end has four black dots that form a square.



The pupa is reddish brown in color

Adult: In the male moth, the forewing generally is shaded gray and brown, with triangular white spots at the tip and near the center of the wing. The forewings of females are less distinctly marked, ranging from a uniform grayish brown to a fine mottling of gray and brown. Adults are nocturnal. Duration of adult life is estimated to average about 10 days

This species seemingly displays a very wide host range. The most frequently consumed plants are field corn and sweet corn, sorghum, Bermuda grass, and grass weeds such as crabgrass, *Digitaria* spp. The UN FAO estimates that *S. frugiperda* will reduce corn yield by 17.7 million metric tons if not successfully controlled. They show cannibalistic behaviour.

Damage and Symptoms: Larvae cause damage by consuming foliage. Young larvae initially consume leaf tissue from one side, leaving the opposite epidermal layer intact. By the second or third instar, larvae begin to make

holes in leaves, and eat from the edge of the leaves inward. Feeding in the whorl of corn often produces a characteristic row of perforations in the leaves while ear feeding results in both quality and yield reduction.



Scraping of leaf, extensive foliage damage, whorl damage with excreta, tassel damage, ear damage.

Management

- Deep plough fields to expose pupae to sunlight and predators.
- Add neem cake @ 200kg/acre
- Follow ridge and furrow planting method
- Seed treatment Cyantraniliprole 19.8% + Thiamethoxam 19.8% FS @ 6 ml/kg of seed offers protection for 15-20 days of crop growth.
- Intercrop with legumes in 2:1 ratio
- Install pheromone traps @ 4/acre
- Natural enemies:

- Egg parasitoid: *Trichogramma pretiosum*,
- Egg-larval parasitoid: *Coccygidium sp*
- Wasp parasitoids: *Cotesia marginiventris* and *Chelonus texanus*.
- Fly parasitoids: *Archytas marmoratus*
- Predators: Striped earwig, Spined soldier bug and insidious flower bug.
- Entomopathogen : *Nomuraea rileyi*
- Early harvest allows many corn ears to escape the higher armyworm densities that develop later in the season

[Ref: FAO (2018), Integrated management of Fall armyworm on Maize: A guide for farmer field schools in Africa.]

Pest status in Bangladesh:

Fall armyworm is a serious pest causing significant economic damage to several crops if it is not controlled in its earlier stages.

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