



FALL ARMYWORM

[*SPODOPTERA FRUGIPERDA* (J. E. SMITH)]

OUTBREAK IN GHANA

– FACTS AND MANAGEMENT APPROACHES

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WHAT IS FALL ARMYWORM (FAW)?

It is a migratory insect pest native to the Americas that was accidentally introduced into some African countries.

In Ghana, it was first reported in the Eastern Region in April 2016 but is now present in all 10 regions of the country. The FAW has caused damage in over 5,000 ha of farmlands across the country and the monetary value of yield losses due to this insect as at April 2017 was approximately US\$164,000,000.00.



EGGS

The development of FAW from egg to adults usually takes about 30 days under tropical conditions (20 – 30 °C).

Females lay eggs in clusters of 100 to 200 eggs.

Total egg production per female ranges between 1,500 and 2,500.

The eggs are usually laid on the underside of leaves and covered with a layer of greyish scales, imparting a mouldy appearance. Eggs hatch into larvae in 2 – 3 days after oviposition by females . (Photo credit: USDA).

Larvae/caterpillars -

The larvae or caterpillars are smooth-skinned and range from shades of brown to gray, green, or yellow-green.

Their most distinguishing characteristic is a whitish inverted Y between the eyes and yellow-white hairlines down their backs. The duration of the larval stage is approximately 14 days under tropical conditions.



Pupa -

Pupation mainly occurs in the soil.

Pupae are shorter than mature larvae and are shiny or reddish brown in colour. The pupal stage lasts 8 – 9 days, after which adults emerge.



White spots at the end of forewings



White spots at the end of forewings

Adults -

The adults (moths) have dark grey, mottled forewings with light and dark patches and a noticeable white spot near the extreme end of the wing. On the average, adults live for about 10 days.



HOST RANGE

Apart from maize, the FAW feeds and damage other economically cultivated grasses and small grains such as sorghum, rice and sugar cane. The host range also includes groundnut, cowpea, cotton and some vegetables such as onion, cabbage, pepper and tomato.

NATURE OF FAW DAMAGE IN MAIZE

Damage is caused by the larvae/caterpillars feeding on leaf tissues, except the veins and midrib, and inside leaf whorls of young maize plants. This leaves a mass of small to large ragged and elongated holes in leaves. Large amounts of moist 'saw-dust' like frass are left near the whorl and on the upper leaves after feeding by the caterpillars (Fig. 4A - B).

The caterpillars may also enter the ear or cob and feed on developing kernels (Fig. 4C).

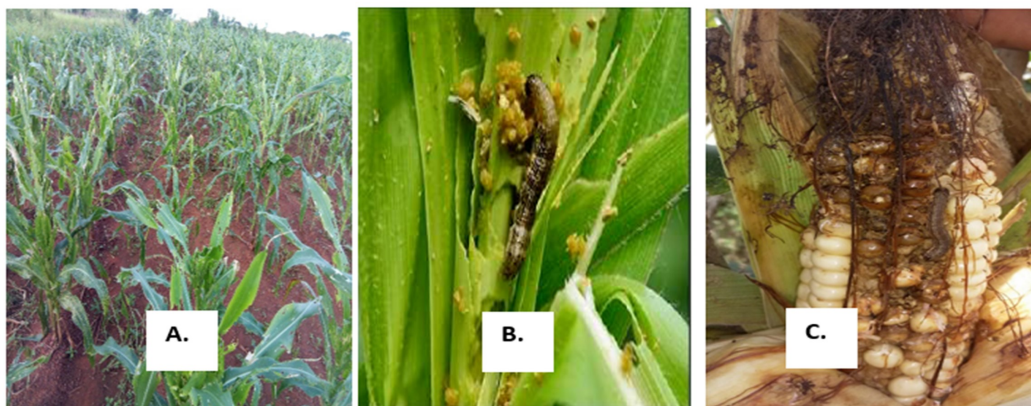


Figure 4. Fall armyworm damage.

A) Damaged maize field; B) Larva feeding in the whorl; C) Larva feeding on maize cob
(Photo credit: Maize Improvement Programme, SARI)

SCOUTING FOR FAW

- Scouting should be done at least once in a week, starting immediately after seedling emergence.
- Fall armyworms are typically distributed in patches in the field, to scout for caterpillars, divide the field into five sections. In each section, randomly select a plant as the first of a set of 20 plants to be thoroughly inspected for signs of feeding damage. Estimate the proportion of damage by dividing the number of damaged plants by 20.
- Also check for the presence of larvae on leaves and in whorls as well as eggs on the underside of leaves. Larvae are predominantly nocturnal; therefore, inspections should include the soil around plants and under crop debris where larvae hide during the day.
- Infestation is severe if the proportion of damaged plants (after averaging proportions from all 5 sections) is more than 0.5 (or 50%); spraying should commence immediately. The presence of a single larvae on at least 10% of sampled plants also suggest a need to apply insecticide.
- High bird presence in the field may reflect heavy FAW infestation.
- Field edges should be monitored for migrating masses of larvae.
- Encourage other farmers to monitor their farms for the presence of FAW. This is because neighbouring farms planted with maize or crops that are alternate host of this insect could serve as breeding sites for the pest. Hence, your farm could be re-infested with FAW from those farms, if not controlled.
- At the community level, farmers should form FAW support groups. Any FAW incidence should be reported to local agriculture extension agents.



CULTURAL CONTROL

- If possible burn crop residues from last season before ploughing; this will kill all pupae, larvae or adults inhabiting in those residues, thus reducing infestation levels in the season.
- With a life cycle of 30 days, at least three generations of FAW will be produced before the season ends. Early planting and use of early maturing varieties will therefore enable the crop to escape the period of peak population build-up and attacks by this pest.
- In smaller farms, FAW eggs could be hand-picked from plants before hatching to reduce pest population and attack.
- All crop residues should be completely destroyed at the end of the season.
- Rotating maize with non-host crops can affect the life cycle and reduce FAW abundance.

CHEMICAL CONTROL

- Chemical control of FAW is most effective when larvae are still small (1/2 inch). Larger larvae (3/4 inch) are difficult to kill because they are usually hidden under the frass plug and in ears of mature plants.
- Fully grown larvae of about 1 ½ inch are not only difficult to control but also not economical as most crop damage has been completed by the pest.
- FAW eggs hatch into larvae within 3 – 5 days after oviposition, contact insecticides, when used, should be sprayed at 3 days intervals to effectively target newly hatched larvae that are easy to control.
- Destroying/killing most larvae during the vegetative growth stage reduces the number of sprays needed during the silking stage.
- Where the severity of infestation is low, patch application of insecticides may be adopted to reduce cost.
- Spraying must be done very early in the morning or late in the evening. It must be done such that sprays enter into the whorls and on the underside of the leaves of all plants.
- Field margins must also be sprayed with insecticides to create a barrier to migrating larvae.

RECOMMENDED INSECTICIDES



- FAW quickly develop resistance to insecticides, thus alternate insecticides of different modes of action and with active ingredients belonging to different WHO classes.
- In Ghana, insecticides with Emamectin benzoate and Chlorpyrifos are reported to be effective at controlling the larvae. These can be alternated with products containing different active ingredients such as Carbaryl, Malathion, Permethrin, or Lambda-Cyhalothrin to delay resistance development.
- Use the right dose of insecticides. Carefully read and follow directions on the label for safe use of all insecticides.
- Your local input dealer or agriculture extension agent can help you to choose products with different modes of action/ class, after reading the label.

BOTANICALS

- Neem-based botanicals can be used to repel moths and larvae from the maize field.



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