

FALL ARMYWORM MANAGEMENT

To prevent or minimize damage by FAW;

- Deep plough the soil to bury the larvae and the pupae or plough to expose them within the upper soil surface.
- Plant early at onset of rains to avoid peak immigration of adult moths
- Destroy crop residues by burying or burning as they provide shelter and food to caterpillars
- Timely and regularly remove weeds from the crop and destroy the surrounding host vegetation.
- Boost the crop growth vigor by using optimum fertilizer application.

Monitor for the presence of FAW

- Scout for FAW egg masses, young caterpillars or early symptoms 2-3 weeks after planting.
- Look for cream or grey egg masses on the underside of leaves covered in grey scales from the female moth
- Check for light green to dark brown larvae with 3 thin yellowish white stripes down the back and a distinct white inverted “Y” on head
- Monitor the whorl for larvae covered with a plug of yellowish brown frass
- Look for patches of small shot holes “window pane” to large ragged and elongated holes in the leaves emerging from the whorl
- Monitor for the damage on 10-20 plants from randomly selected sites in the field. Focus on the newest two to three (2-3) leaves emerging from the whorl as this is where FAW likes to feed and where FAW moth lay eggs.
- At late whorl stage, examine the newest three to four (3-4) leaves emerging from the whorl plus the emerging tassel. Signs of infested whorls include fresh window panes (in the whorl), larvae, frass, and fresh whorl feeding damage.

- Take action as elaborated below when the infestation reaches 20% at early whorl stage or 40% at late whorl stage.

To control fall armyworm;

- On a small scale, handpick and destroy any egg masses and caterpillars, where feasible.
- Over 20% infestation, spray with a pesticide formulation of Profenofos 40% + Cypermethrin 4% EC (20-50 ml per 20 liters of water) or Thiamethoxam 141g/l + Lambda-Cyhalothrin 106g/l at rate of 10-20 ml per 20 liters of water.
- Direct the spray into the plant whorl. To be effective, spray early in the morning or late in the evening when caterpillars are actively feeding.
- When handling pesticides, always wear protective clothing and follow instructions on the product label
- Aim the spray at plant rows and not between rows to ensure that the target is reached with the maximum spray volume.
- Do not use chemicals with the same mode of action year after year as this can lead to resistance build up.
- Evaluations of FAW biological control agents and bio-rational pesticides are underway. These are expected to be available soon and will reduce on use of the synthetic pesticides

References:

1. B.M. Prasanna, Joseph E. Huesing, Regina Eddy, Virginia M. Peschke (eds). 2018. Fall Armyworm in Africa: A Guide for Integrated Pest Management, *First Edition*. Mexico, CDMX: CIMMYT.
2. FAO (2008). Integrated management of Fall armyworm on maize: A guide for farmer field schools in Africa.

For more information, contact;

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MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES

FALL ARMYWORM OUTBREAK MANAGEMENT IN UGANDA



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BACKGROUND

Fall armyworm (*Spodoptera frugiperda*), FAW, is an insect pest native to tropical and subtropical regions of Americas. It is new to Africa and was first detected in central and west Africa in early 2016. The pest was first reported in Uganda in June 2016 in Kayunga, Kasese and Bukedea districts and by end of 2017, the pest had spread to all the districts.

FAW is a migratory, highly polyphagous pest capable of feeding on more than 80 plant species with cereals (maize and sorghum) being the most preferred hosts. In Uganda, the pest has been observed feeding on maize, sorghum, sugarcane, rice, napier grass and rhodes grass.

FAW is migratory and adult moths can cover over 500km before oviposition. The pest can persist in an area throughout the year where suitable environmental conditions and hosts exist. Thus, with this conducive environment, FAW is likely to build permanent and significant populations making complete eradication of the pest impossible.

THE FALL ARMYWORM LIFE CYCLE

1. Eggs

FAW adult female moths after mating lay eggs in masses of 100 to 200 eggs per batch usually on the underside of leaves but also the upper side and on stems. Each female lays a total of 1500 to 2000 eggs in her life time and the eggs are covered by whitish anal hairs of the moth.



FAW egg mass on maize leaf and stalk

2. Larva

The larvae emerge from eggs within 2 to 3 days and the young caterpillars start feeding on the leaves. The young caterpillars are greenish in color with a black head. The head turns more into orange color in the second instar.

In the third instar, the dorsal surface of the body turns brownish with lateral white lines forming.

In the fourth to sixth instars, the head is reddish brown, mottled with white and brownish body. The body bears white subdorsal and lateral lines. Elevated spots occur dorsally on the body and they are usually dark in color.

The head of mature larva is marked with a white inverted “Y”. The larva has a set of four large spots that form a square on the upper surface of the second last segment and larvae tend to conceal themselves during the brightest time of the day. Duration of larval stage is about 14 days.



The inverted 'Y' on the FAW

The four raised square dots

3. Pupa

Fully developed larvae usually burrow into the soil 2-8cm deep to pupate inside a cocoon but also in between leaves on the plant. Pupa can also be found in ears of maize plants. FAW pupa is reddish brown in color and the duration of pupa stage is about 8-9 days.



Fall armyworm pupa

Fall armyworm pupa in the soil

4. Adult

Adult moths emerge at night and can travel great distances before oviposition. The male moth is generally shaded grey and brown with triangular white spots at the tip and near center of the wings. Adult moths are nocturnal & most active during warm humid evenings.



Adult male FAW moth



Adult female FAW moth

DAMAGE BY FALL ARMYWORM

The larvae is the damaging stage of FAW which feeds on different parts of host plants. The larvae usually feed on leaves, creating a “windowing” effect and moist sawdust-like frass within the whorl and the upper leaves. This kills the growing point early in the season preventing any cobs from forming.



FAW early feeding symptoms



Damage to the maize whorl

In young plants, the stem may be cut. In older plants, the larvae can bore into developing reproductive structures such as tassels and cobs reducing the yield quantity and quality.



Damage to the tassel (A)



and cob (B) by FAW larvae



Maize whorl damage by FAW



Tassel damage by FAW