Note: *Insecticides and biopesticides are only effective on young caterpillars. For maize it is recommended that spray should be done before the caterpillars enter the ears or funnel.*

Management option using the Climate Smart Push Pull Technology

1. Prepare the soil carefully so that it is as fine as possible, for initial establishment.
2. Ensure the push pull technology is well laid out and properly established for effective FAW control among other benefits.
3. Under the technology, the maize or sorghum cereal will be inter-cropped with ***desmodium*** and surrounded by a fodder trap crop of Mulatto 2 (***Brachiaria spp***) both of which will help repel the FAW and protect the food crop.
4. Use of fertilizer is recommended, especially in the initial planting to enable a fast and good establishment, enabling an early protection from FAW, Stemborers and ***Striga*** weed.
5. Keep the field weed free. To allow the ***desmodium*** to grow and canopy well

Note: Do not graze livestock on the push pull technology plot

Advantages of adopting the climate-smart push–pull technology

- Cereal crop is protected from fall armyworm by this technology hence more maize and sorghum yields.
- A continuous supply of cattle green feed from the ***Brachiaria*** and ***Desmodium***.
- Earn an income from sales of ***Desmodium*** and ***Brachiaria*** hay.
- Nitrogen fixed in your farm by the ***Desmodium***, hence saving on fertiliser costs.
- Soil protected from erosion by ***Desmodium*** cover crop and mulch
- Increase in profits from the sale of ***Desmodium*** seeds at high prices.
- Increase in cash from selling more milk from your cattle and goats.
- Saving on farm labour, as you do not have to pull out ***Striga*** weed.

Where do I get information on Push-pull technology

Contact ICIPE or nearest Agriculture office for direction

icipe – Working in Africa for Africa...

The International Centre of Insect Physiology and Ecology (*icipe*) was established in 1970 in direct response to the need for alternative and environmentally friendly pest and vector management strategies. Head-quartered in Nairobi, Kenya, ***icipe*** is mandated to conduct research and develop methods that are effective, selective, non-polluting, non-resistance inducing, and which are affordable to resource-limited rural and urban communities. ***icipe's*** mandate further extends to the conservation and utilisation of the rich insect biodiversity found in Africa. ***icipe's*** Capacity Building Programme aims to promote the development and utilisation of sustainable arthropod management technologies by enhancing the research and training capabilities of countries in Africa. The Centre's major areas of capacity building activity are: (i) Capacity building and professional development of university lecturers, researchers, and professionals in insect and related sciences; (ii) institutional development by nurturing and strengthening higher education, research and extension institutions;

(iii) promoting innovations on insect science, in collaboration with regional and national agricultural research and advisory services, and the private sector. These objectives are realised through postgraduate training at PhD and MSc levels, professional development schemes for scientists, and non-degree training for technicians, scientists, community members and extension workers.

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PUSH PULL CONTROLS THE FALL ARMY WORM MENACE

Using a technology option which will control, ensure reliable food production and sustained support for the smallholder farmer

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Have you seen fall armyworm damage your fodder crop?

Upon invasion, the maize crop is quickly destroyed. Fall armyworm is a brutal feeder. The larvae feed mainly on the outer foliage, making large and ragged holes. A severe attack gives the appearance of maize that has been damaged by hailstones. After feeding FAW larvae leave behind large amounts of moist sawdust-like frass near the whorl and upper leaves. Before pupation, the larvae feed and move permanently through the whorl causing a line of identical "shot" holes when the leaf unfurls

How to identify the FAW?

Its head has a predominantly white inverted (upside-down) Y-shaped suture between the eyes. Newly hatched larvae are greenish in colour and have black heads. They move in a looping motion. Mature larvae are smooth-skinned and vary in colour from greenish or brownish (light tan) to nearly black. They have three yellow white hairlines (stripes) down their backs.

Details of the fall armyworm head

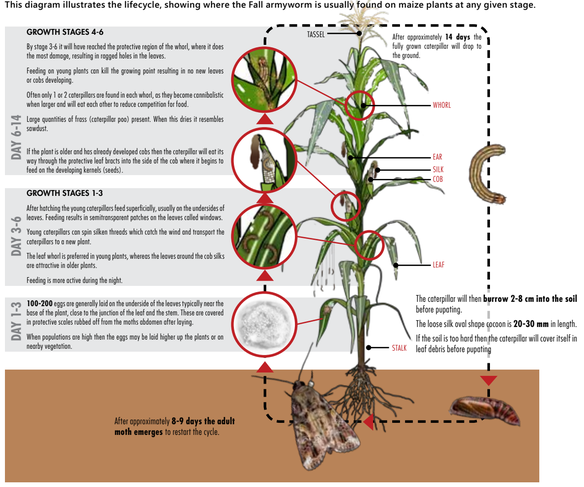
Lateral view of the fall armyworm

Dorsal view of the fall armyworm

Caterpillars enter through the side of the ear and feed on developing kernels. This is different to stem- borers which usually enter from the top or bottom of the ear.

Fall Armyworm: Life cycle and damage to Maize

The Fall armyworm lifecycle includes egg, 6 growth stages of caterpillar development (instars), pupa and moth.
This diagram illustrates the lifecycle, showing where the Fall armyworm is usually found on maize plants at any given stage.



How is fall armyworm spread?

The adult moth can fly over 30km – 100km in one night drifting through air current. The female is very fertile, laying 1500- 2000 eggs in her life time, enabling the pest to quickly establish in new areas. The egg batches are normally on the underside of leaves. The eggs are covered by of grayish scales which gives a moldy appearance. The movement of infested plant also aids in the movement of the fall armyworm in different stages to new locations. This can be through the movement of green vegetables, fodder and green maize. Hence the public, especially farmers are discouraged from moving infested plant materials to new areas where the FAW has not been reportedly sighted. Its life cycle, ability to spread and reproduce quickly differentiates it from what farmers are used to, such as the African armyworm (***Spodoptera exempta***), a less destructive species

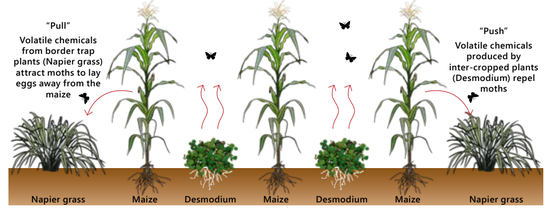
What is Fall Armyworm (*FAW*)? (*Spodoptera frugiperda*).

Fall armyworm (***Spodoptera frugiperda***), FAW, is a species of American origin. It is a heavy feeder, thus it derives its name from its feeding habit. . Once an "army" of fall armyworms infest an area, they eat almost everything in the area, before moving to the next available food source.

Why is Fall armyworm important?

The fall armyworms are heavy feeders. It feeds on more than 80 varieties of crops. Fall armyworms can feed any time of the day or night. However, they are most active early in the morning or late in the evening. When they are many, the fall armyworm larvae crawl in great armies to bordering fields

A well planted push pull field, a technology which repels FAW looks like this



How to manage Fall armyworms

1. Prepare the land well, remove (rouge out) any traces of fodder trash and grass especially if there was any infestation in the field targeted for planting.
2. Plough deeply to expose young pupae to the surface of the soil
3. Sow early to avoid peak immigration of adult moths. Try avoid planting new crops near heavily infested fields
4. Cut weeds and remove all the crop residues because they provide potential shelter sites and the critical food the caterpillar need to survive.
5. Closely monitor the crop and be informed about adjacent area in case of invasions
6. Apart from the combination of Monitoring, Mechanical ploughing and appropriate planting practices, farmers often use synthetic insecticides for control.