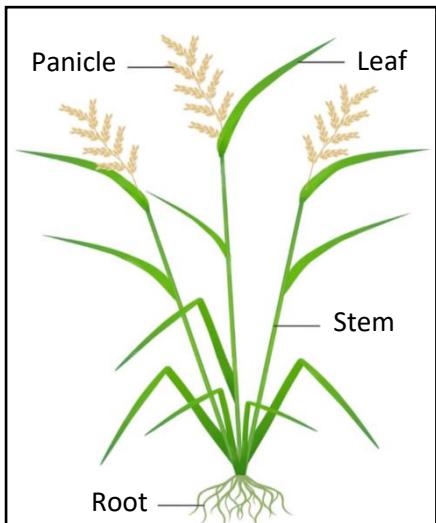


# RICe

## Main Pest: Stem Borers

4 main stem borers in Tanzania:

- **White stem borer** (*Maliarpha separatella*)
- **African pink borer** (*Sesamia calamistis*)
- **Spotted stem borer** (*Chilo partellus*)
- **Stalk-eyed fly** (*Diopsis thoracica*)



### Moths:



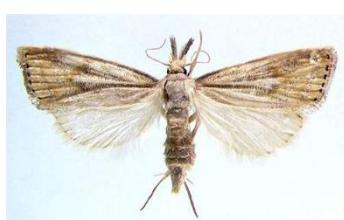
**White stem borer**

- 110-150mm long
- Long pale-yellow wings



**African pink borer**

- Wingspan = 20-30mm
- Pale brown wings
- Silky appearance
- Nocturnal



**Spotted stem borer**

- Wingspan 20-25mm
- Forewings are yellow-brown with dark scale pattern
- Hindwings are white

### Flies:



**Stalk-eyed fly**

### Characteristics

- Grow up to 10mm
- Black thorax with reddish brown abdomen

Stem borers are also common pests of maize, sorghum, millet and sugarcane

**Distribution:** These pests can be found in the Mbeya, Morogoro, Mwanza, Shinyanga, Coast and Zanzibar regions of Tanzania.

## Symptoms

- Reduced plant height
- Reduced total number of grains per panicle
- Reduced grain weight
- Dead heart symptom  
(death of central shoot)
- White head  
(white, empty panicles stand upright)



White head



Dead heart

## Control measures



Inspect regularly for pests



Early planting (only after the first effective rains)

Can reduce the incidence of pests



Intercropping

Can prevent the migration of larvae from one plant to another



Remove host weeds and wild rice during the dry season



Attract and maintain natural predators  
(for example, with wildflower borders)

Natural predators include:

- Parasitoid wasps such as *Chelonus maudae*, *Pristomerus cans* and *Goniozus indicus*
- Pathogens such as *Beauveria* sp.

# SUGARCANE



## Main Pest: Pink Sugarcane Mealybugs

Mealybugs are a type of scale insect, they are sap-sucking pests that can also transmit plant diseases, seriously reducing sugarcane yield.

### Characteristics

- Mealybugs tend to be around 1cm in length
- Pink coloured body
- Covered in a white sticky powder resembling cornmeal and giving them the name 'mealybug'. The pink sugarcane mealybug has a thinner mealy wax layer, allowing its pink body to show through

### Symptoms

- Abnormal colour leaves
- Honedew or sooty mould on leaves
- External feeding of roots and stems



Sooty Mould

Mealybugs are also common pests of cassava, mango and okra

# Soft Scale Insects

## Characteristics

- Like mealybugs, body covered in waxy shell resembling cottony cushions
- Produce a lot of clear sticky liquid called honeydew

An ant infestation can also be a first sign of a soft scale infestation as they harvest the honeydew. However, ants will often help soft scale thrive by moving them from plant to plant.

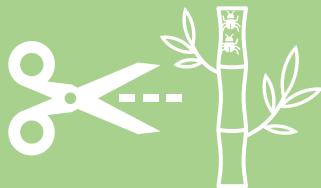
## Symptoms

- Circular smoky-brown or greyish-black covers on stems and leaf mid-ribs
- Leaves unhealthy pale green colour
- Non opening, yellow leaves
- Stunted growth



## Control measures for mealybugs and soft scale insects

### Removing and destroying heavily infected plants



### Inspect for pests regularly



Remove mealybugs by rubbing, picking, or spraying affected part of crop to stop infestations growing.

### Avoid overusing nitrogenous fertilizers



### Attract and maintain natural predators



Natural predators include:

- Ladybird beetles
- Hoverflies
- Green Lacewings
- A range of parasitoids such as parasitoid wasps

# MAIZE

Maize has many crop pests with the most common being **stem borers** and **aphids**. Other pests include **armyworms** and **cutworms**.

## Armyworm



**Adult armyworm (moth)**



**Armyworm at caterpillar stage**

- 1.4 - 1.8 cm long
- Wingspan: 3cm
- Forewings are dark brown with grey markings
- Hindwings are white with dark veins
- Grow up to 4cm long
- Greenish brown body with a thin stripe down the centre and 2 orange stripes along each side
- Active at night (found in soil during day)

## Symptoms

It is the larvae that cause damage to the crop, feeding on the leaves, growing points and young stems. This gives the leaves ragged edges. Some may even create holes in the leaf that cause it to dry up and have a scorched appearance.

## Control measures



**Inspect regularly**  
Especially at night when caterpillars are active



**Attract natural predators**  
Maintaining natural surroundings with plenty of breeding places for them, like trees and shrubs

**Natural predators**  
include:

Lacewings, wasps, flies, and spiders attack the caterpillar.

Night birds and bats feed on the moths

# Cutworm



The cutworm at larval stage.

This is the stage that the cutworm is a pest

## Characteristics

- 2-5cm long
- Dark grey/brown colour
- Feed mainly on seedlings, cutting the stem below or on the soil surface
- Feed at night



(Cutworm at moth stage)

## Symptoms

- Leaves with chewed edges
- Small holes in the stems
- Small holes in the roots
- Cut stems, causing the plant to fall or wilt
- Missing stems: the cutworms cut at the base of the stem and carry the stem back to their burrow

## Control measures



**Attract natural predators**  
by maintaining natural surroundings and wildflower borders.  
Natural predators include Tachinid flies and Braconid wasps.



**Remove weeds** around a week before planting (removes suitable habitat for female to lay eggs)



**Ploughing during the crop growing season** exposes the caterpillars to predators such as birds

# MANGO

## Oriental Fruitfly

Other pests of mango include:

- Mango seed weevil
- Mealybugs

Oriental fruitfly infest a range of fruits globally, including banana, avocado, papaya and citrus.

### Characteristics

- Colourful with wings banded or spotted with brown
- Two wings, each wing 4-7mm long
- Yellow and dark brown to black marking on the thorax
- Marking on abdomen usually form a "T" shape



Oriental fruitfly

### Symptoms

- Rotting and decomposition of fruits



**Fruit infested with larvae** - The eggs of a fruit fly are laid within the fruit, where they hatch and feed.

### Control measures

Inspect for pests and puncture marks regularly, use fruitfly traps to monitor and trap fruitflies



Open suspect fruits to check for larvae



Attract natural predators such as parasitoid wasps



# OKRA

Aphids attack a number of plants including cotton, groundnut, pumpkin, sweet potato, mango, sugarcane and maize, making them one of Africa's biggest pests.

## Cotton aphids

### Characteristics

- 1-1.5mm in length
- Colours range from yellow to dark green, depending on climate and host plant
- Excrete honeydew



**Yellow cotton aphid infestation**

### Symptoms

- Yellowing of leaves to begin with that become puckered and curled as aphid numbers increase
- Sooty mould
- Stunted plants with twisted stems



Aphids also carry a range of diseases that may also threaten crops.

**Green cotton aphid infestation**

### Control measures

Inspect for pests regularly



Attract natural predators such as ladybird beetles, green and brown lacewings, hoverflies, and spiders



# CASSAVA

Whitefly are a common pest of cassava, that cause damage to crops similar to aphids.

## Whitefly

### Characteristics

- 1-3 mm in length
- Flat and oval, resembling small moths
- Covered in a white, opaque powder
- 4 transparent or clouded wings



**Whitefly**

Other pests of cassava include stem borers, scale insects and mealybugs.

### Symptoms

- Sooty mould
- Yellowing and curling of leaves
- Cassava Mosaic disease



**Cassava mosaic disease:** Symptoms include stunting of growth, distorted leaves with irregular green, yellow or white patches

### Control measures

Check for white-brown eggs on the underside of leaves



Attract natural predators such as ladybird beetles, lacewings, hoverflies, and



Provide suitable irrigation for crops to reduce risk of whitefly damage



# Sweet Potato

Weevils are also known as snout beetles. They are a major pest to crops like sweet potato all around the world.

## Sweet potato weevil

### Characteristics

- Long, thin, ant-like body head and legs
- Black head, orange antennae, thorax and legs and a metallic blue abdomen
- Appears to be smooth and shiny
- Curved snout
- 3-4 mm



**Sweet potato weevil**

### Symptoms

- External feeding of roots, leaves and stems, leaving behind round feeding punctures
- Malformation, thickening and cracking of the vine
- Pale green leaves

### Other types of destructive weevils:



**Grain weevil**

Bores holes inside cereal grains and implants eggs inside



**Rice weevil**

Adults feed on whole grains whilst larvae develop inside grains

**Mango seed weevils** are another major pest

### Control measures

**Keep soils well-watered:** dry, cracked soil is a favourable environment for weevils.



Check upper 15 cm of soil and lower 15 cm of the vine for larvae



Attract predators such as wasps and ants



# Pigeon pea

Pod borers are some of the most common pests of pigeon pea. Pod borers include the African Bollworm.

## African Bollworm



Caterpillar stage

### Characteristics (caterpillar)

- 3-4 cm long
- Colour ranges from yellow/white to reddish brown with age
- Black bumps and short hairs along their backs give them a spotted appearance



(Moth stage)

### Symptoms

- Circular holes through fruits/pods
- Caterpillar faeces should be evident around damaged areas
- Hole in leaves

### Other pod borers include:

#### Bean pod borer



#### Pulse pod borer



### Control measures



Check for eggs regularly (tiny white/yellow eggs)



Attract natural predators such as wasps with wildflowers



Plant trap crops such as sunflowers



Plough field to expose pest to the sun and predators