Ministry of Agriculture, Irrigation
and Water Development

PEST MANAGEMENT IN COTTON



PEST MANAGEMENT IN COTTON

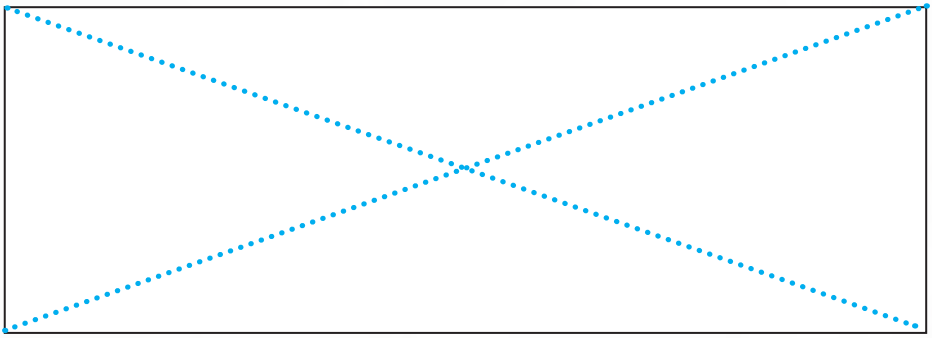
Cotton is very susceptible to pests. It is therefore important for farmers to manage pests in cotton production in order to improve yield.

Farmers must scout their fields regularly to determine the level of pest infestation and the control methods. Scouting is the process of walking through a field inspecting a given number of plants per given area to identify pests infesting the crop and determine their abundance. Scouting enables a farmer to determine if it is necessary to do so apply pesticide and to identify the right pesticide.

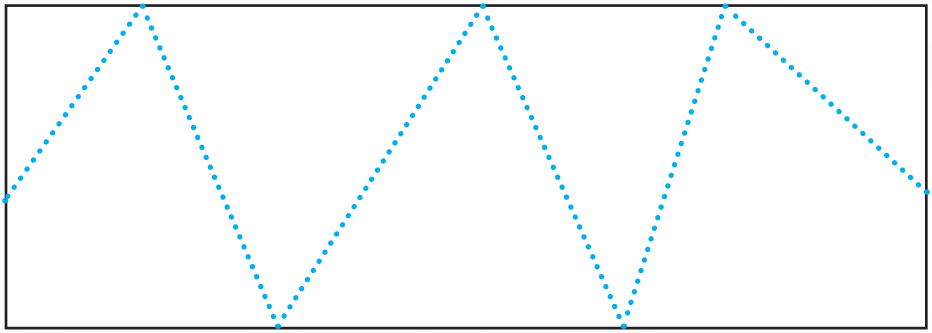
NOTE: Application of pesticides should be done once every week.

There are two main scouting techniques;

- The diagonal method
- The Zigzag method



Diagonal method



Zigzag method

IDENTIFICATION AND CONTROL OF IMPORTANT PESTS IN COTTON PRODUCTION

APHIDS





Figure 1: Adult Figure



2: Damage

Figure 8: B

Description

- Yellowish to dark or black in colour, cornicles on abdomen,
- Mostly wingless, wings forms are noticed throughout the season but are more noticeable at the beginning and towards the end of the growing season
- If winged, the wings are transparent &held like a roof over the body.

Damage

- Causes leaves to curl downwards and become crinkled
- Growing plants are crinkled and stunted
- Honey dew
- Nymphs as well as adults suck cell sap.
- Aphids excrete a honey dew like substance which attracts the black sooty mould (Capnodium spp.) which adversely affect photosynthesis.

Control

Apply chemicals when aphids are present on 6 out of 24 plants

- Plant seed treated with Gaucho at the rate of 5g/litre or Moncerene GT at the rate of 4ml/100g of seed.
- Apply dimethoate 400EC at the rate of 17ml/14litres
- Apply Acetamiprid 222Sl at the rate 222g/litre.

JASSIDS

Description

- Nymphs and adults are greenish yellow in colour with a black spot on the tip of each forewing
- They are found on the underside of the leaves
- They move sideways
- Adults fly away when disturbed
- Eggs are yellowish white



Figure 3: Adult Jassid

Damage

- Nymphs and adults both suck the cell sap from the leaves
- Leaves firstly show yellow and then reddish spots
- Attacked leaves turn downwards, dry out and fall
- Plants become weak and their fruit falls



Figure 4: Jassid damage

Control

Apply the following chemicals when 2 nymphs are present per leaf using standard rates:

- Profenofos 50 EC at the rate of 40ml/16litres.
- Acetamiprid at the rate of 50ml plus buffer/ ha.
- Thiomethoxam at the rate of 100ml/100kg.

COTTON MEALY BUG

Description

- It is a polyphagous pest and multiplies on different hosts
- They suck a large amount of sap from leaves and stems to the point of drying
- They are cottony in appearance, small, oval, soft-bodied covered with white mealy wax.





Figure 5: Adult Mealybug

Damage

- Growing points become stunted and swollen
- Thick mat with waxy secretion on the plants
- Secretes honey dew and develop black sooty moulds
- Both nymphs and adult suck cell sap causing withering and yellowing of leaves
- Heavy infestation can cause defoliation and even death of plants
- It affects the development of flowers and stems
- Retarded growth and late opening of bolls
- Injects saliva that causes curling & contortion of leaves



Figure 6: Mealybug damage

Control

Apply the following pesticides using standard rates:

- Malathion 250WP at the rate of 250g/100litres of water.
- Imidacloprid 200SL at the rate of 5g/kg seed.

AFRICAN BOLLWORM

Description

- It is a polyphagous plague that attacks diverse agricultural cultures.
- Has yellow eggs
- It can feed on plants of different botanical families including cotton.
- The caterpillars have four pairs of false legs.
- Adults are medium sized, light brown coloured moths
- Fore wings- are light brown with a prominent black spots on the wing
- Hind wings- are grey coloured with broad black patch along the apical margin



Figure 7: African bollworm

Damage

- Larvae attacks all stages of plant growth. Larval feeding can result in: seedlings being tipped out, chewing damage to squares and small bolls causing them to shed, and chewed holes in maturing bolls, preventing normal development and encouraging boll rot.

Control

Spraying has to be done when 6 or more eggs are found on 24 plants using standard rates

- Decis forte at the rate of 50ml/16 litres.
- Thunder 145 SQ TEQ at the rate of 100g/litre
- Dettamax 2.5WP at the rate of 100g/litre.
- Dettamax 2.5EC at the rate of 25ml /16litres.
- Cypersuper 20EC at rate 85g/14 liters.
- Carbayrl 85 WP at rate 85g/14 liters
- Cypermethrin 20EC at the rate of 10ml/14litres

RED BOLLWORM

Description

- Eggs are sky blue in color and turn grey before hatching and are laid singly.
- Older larvae have characteristic rose red arrow head markings.



Figure 9: Red bollworm

Damage

Larvae will feed inside the bud or boll without exposing part of the body.

Control

Apply the following chemicals using standard rates:

- Decis forte at the rate of 50ml/16 litres.
- Thunder 145 SQ TEQ at the rate of 100g/litre
- Dettamax 2.5WP at the rate of 100g/litre.
- Dettamax 2.5EC at the rate of 25ml /16litres.
- Cypersuper 20EC at rate 85g/14 liters.
- Carbayrl 85 WP at rate 85g/14 liters
- Cypermethrin 20EC at the rate of 10ml/14litres.

PINK BOLLWORM

Description

- Adult is a small moth. Wings are fringed and reddish brown with numerous black spots.
- Larvae are whitish in color during early stage and as it grows turn pinkish with dark brown head and prothoracic shield.



Figure 10: Pink bollworm (late stage larvae)

- Pupation is in a flimsy cocoon in boll, often in seeds, hollowed out by the larva.
- Some larvae undergo hibernation and are responsible for the infestation of the subsequent crop.

Damage



Figure 11: Pink Bollworm damage

- Infestation of flower buds causes shedding of buds.
- Flower infestation leads to the formation of rosette flower.
- Reduction of lint development, destruction of seed and weakened lint.
- Infested bolls open prematurely exposing the saprophytic fungi to grow on them.
- If seeds are used for sowing, the germination is reduced.

Control

Apply the following pesticides using standard rates:

- Carbayrl 85 WP at rate 85g/14 liters when the eggs are noticed.
- Spray steward 150EC at the rate of 150ml/litre.
- Uproot and burn all the affected plants.

SPINY BOLLWORM

Description

The eggs are difficult to detect because of their small size but they are blue green in colour.

- The larvae are stout and spindle shaped
- There are also a number of long hairs on each segment
- The colour varies but is generally brown or grey with darker markings and some orange spots
- The pupa is greyish and brownish in color



Figure 12: Spiny bollworm

Damage

The larvae will burrow the tip of the cotton plant **Control**

Apply the following pesticides using standard rates

- Decis forte at the rate of 50ml/16 litres.
- Cypermethrin 20EC at the rate of 10ml/14litres.
- Carbayrl 85 WP at rate 85g/14 liters

COTTON STAINERS

Description

- Eggs are creamy-white
- First instar nymphs are yellow or bright red and unmarked
- Adults are red to reddish-orange



Figure 13: Cotton stainer

Damage

- Feed on seeds affecting boll development
- Bolls may shed or open with immature fibre
- Punctured young seeds may shrivel and lose viability
- Red stained lint and rotting bolls.
- Inner boll walls with warty growth or water soaked spots
- Young bolls abort and turn dark brown
- The bacterium Nematospora gossypii enters the site of injury and stains the fiber.



Figure 14: Cotton stainer damage

Control

- Apply Carbayrl 85 WP at rate 85g/14 liters.

THRIPS *Frankliniella occidentalis*





Figure 15:Adult thrip



Figure 16:Thrips damage

Description

- Tiny, slender insects less than 0.06 inch (1.55 mm) long.
- Western flower thrips are by far the most common thrips on cotton and may be found all season.
- They are light colored; adults have clear, slender wings.
- The bean thrips occasionally appears on cotton in summer, usually at field edges.
- Immature bean thrips have orange or red spots at either side on the end of their abdomen;
- Adults are usually dark with white bands on their wings.

Damage

- Feed on leaves and buds and may sometimes cause seedling leaves to become distorted,
- Seedlings may appear severely deformed they will grow out of the damage rapidly with the onset of hot weather.
- Bean thrips feed on the cotton plant and may cause mature leaves to turn coppery brown or red and lower leaves to drop.
- Bean thrips injury may resemble spider mite injury, but affected leaves are covered with tiny black specks, which are the faeces of the thrips.

Control

Spray stewart 150EC at the rate of 150ml/litre.

COTTON LEAF ROLLER





Figure 17: Cotton leaf roller

Description

- The leaf roller is a common pest, which may cause considerable local damage
- They are dirty pale green and semi-translucent and up to 30 mm long when fully grown.
- Moths lay eggs on the underside of leaves.
- Young caterpillars feed initially on the underside of leaves, but older caterpillars spin or roll leaves together, and eat the leaf margins, causing the leaves to curl and droop.
- They pupate in the leaf roll or in debris on the ground.

Damage

- In extreme cases, the cotton plants may be almost completely defoliated,
- Stunted growth
- Premature boll ripening.

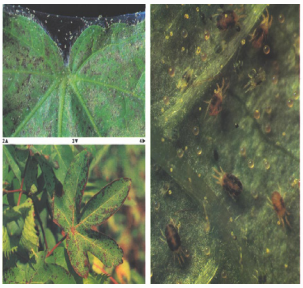


Figure 18: Cotton leaf roller damage

Control

- Leaf rollers are difficult to control as they are hidden inside the rolled leaves.
- Use systemic pesticide like acetamiprid at the rate of 50ml plus buffer/ha.

RED SPIDER MITE, *Tetranychus spp*



Description

- Eggs are spherical about 0.1 mm in diameter, visible only under magnification.
- Eggs are white to amber coloured, looking rather like oil droplets.
- Larvae are pinkish with six legs and develop eight-legs later before becoming adults.
- Only females are visible under unaided eye as red or reddish-brown dots on the underside of the leaf.
- Mite infestation usually begins in a localized area on a patch of cotton field having originated from the neighbouring wild hosts and dispersed by wind.



Figure 19: Adult red spider mite

Damage

- Infestation usually begins on the undersurface of the leaf near the junction of the veins and the petiole.
- The surface attains a yellow mottled appearance, and as the infestation level increases, the leaf turns yellow and leathery.
- Severely damaged leaves turn red and are shed.
- When mite populations are very high, the undersurface of infested leaves is covered with fine webbing.
- Injury caused by mites results in decreased growth, flowering and fruit production.
- This is because there is reduced photosynthesis resulting from damaged chloroplasts and increased water loss due to damaged epidermis and mesophyll cells.
- The reduction in yield, however, depends on the mite species and earliness of attack



Figure 20: Red spider mite damage

Control

- Apply dimethoate 17ml/14litres.

WHITEFLY, *Bemisia tabaci*



Figure 21: Adult whitefly

Description

- The minute, iridescent green eggs are laid on the undersurface of the youngest fully expanded leaves.
- First instar nymph or crawler will move to select a feeding site where it settles, moults, becomes sessile after losing legs and antennae.
- Second and third instar are flattened, ovate and scale-like which remain sedentary but continue to feed.
- Fourth instar is distinguished from the third by the appearance of the reddish-coloured compound eyes of the developing adult.
- Adult whitefly has a pale yellow body with two pairs of wings covered in white wax.

Damage

- Can be mechanical due to direct feeding, resulting in physiological changes in the plant.
- contamination of lint with copious amounts of honeydew, which makes the lint unfit for sale.
- Contaminated cotton is difficult to gin and spin as the ginning mills will require more frequent replacement of the saws and spinning looms are clogged.

- Honeydew will also interfere with normal functioning of the leaves, particularly when sooty mould growing on the honeydew medium has blackened the plants, further resulting in reduced seed cotton yields.



Figure 22: Whitefly damage

Control

Apply dimethoate at the rate 17ml/14litres and acetamiprid at the rate of 50ml plus buffer/ha.





Designed by
Agriculture Communication Branch
P.O. Box 594
Lilongwe

2019